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FOREIGN NOISE RESEARCH

IN NOISE EFFECTS

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF NOISE ABATEMENT AND CONTROL
WASHINGTON, D.C. 20460

A SURVEY OF FOREIGN NOISE EFFECTS RESEARCH

January 1978

U. S. Environmental Protection Agency
Office of Noise Abatement and Control

PREFACE

In 1976 and 1977 the Second Interagency Noise Effects Research Panel met to review, evaluate and make recommendations on U.S. government supported noise effects research. This interagency group includes representatives from 15 agencies and is supported by the U.S. Environmental Protection Agency's Office of Noise Abatement and Control, which acts as secretariat. The Panel's chairman is Dr. H. E. Von Gierke, of the Aerospace Medical Research Laboratory at Wright-Patterson Air Force Base, Ohio. In addition to its primary task of assessing U.S. research, the Panel was interested in finding out about noise effects research abroad. A survey was conducted for this purpose by Informatica Inc. under the supervision of Ms. Alice Suter of EPA, Office of Noise Abatement and Control.

This volume has been compiled from the results of the survey. Although this is not a comprehensive review of current noise effects research abroad, it gives some idea of the magnitude of research in this area and the current state of the art. Hopefully too, it may stimulate the exchange of information between investigators. An attempt has been made to include complete addresses and citations of published work, and a brief description of the project whenever possible.

In addition to the survey several other information sources were used which should be acknowledged. Most of the British project descriptions were taken from "The Index of Current Noise Research in the United Kingdom 1975/1976," (E. N. Harley), published by the National Physical Laboratory. The main information source for the projects from West Germany was the "UKOFAT" catalog of the UMPLIS* System.

* Environmental information data base of the Bundesministerium des Innern, Bonn.

Scope

Approximately 200 projects have been reported from 22 countries. Most of the projects are from European countries. The greatest number of projects are reported from the United Kingdom and West Germany because of additional sources of information. Projects reported are either currently active or were completed in the last two or three years.

Classification Scheme

Projects are classified and reported by a nine-category subject scheme devised by the Panel. Basically, the subject areas correspond to the effects of noise including auditory, non-auditory physiological, psychological and performance effects, communication interference, sleep disturbance and community annoyance. In addition, there are categories for noise environment determination and the combined effects of noise and vibration. A few studies are listed under more than one category, because the studies dealt with more than one subject area or were general in nature[A], but in most cases double classification was avoided.

An index in the back of the volume references projects by country.

[A] These may be identified in the Index of Projects by Country beginning on page 77.

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Austria	Impulse Noise and Temporary Threshold Shift In a series of investigations the effects of impulse noise on TTS shall be explored and mathematical models to describe these effects will be compared. Different kinds of impulse noise will be used for noise exposure.	Professor Manfred Haider Inst. f. Umwelthygiene d. Univ Wien Austria	Completion 1978
Canada	Program on Hearing Protection Areas of concern are in-ear measurement of noise and hearing protectors. Publication: "Effects of Noise on Man," prepared by Dr. George Thiessen	Nat'l Research Council of Canada Montreal Road Ottawa, ON K1A 0S1 Canada " " " " "	
Federal Republic of Germany	The Effects of Working Noise on Lumbermen and the Environment Audiometric measurements on a representative group of workers subjected to noise and a control group working without noise. Statistical evaluation.	Prof. Dr. Gerhard Kaminsky Institute for Labor Science of the Federal Research Office for Forestry and the Lumber Industry, Vorwerkshuach 1 Reinbek FRG	1974 to 1984
	Effect of Noise on Particular Groups of People, Especially Children and Old People Basic research in the area of noise protection. Creation of physiological, psychological, sociological and economic bases for noise control, especially in the area of legislation and in spatial planning as well as in work involving the development of norms and guidelines.	Dr. G. Jansen Institut fur Arbeits-und Sozialmedizin Johannes-Gutenberg-Universitat Obere Zahlbacher Str. 67 D-6500 Mainz FRG	1973 to 1976
	Effect of Impulsive Noise on Living Creatures Investigations directed toward an understanding of how anatomical damage can arise with the purpose of setting up norms on possible threshold limits. Biological, biochemical, physiological and psychoacoustical research methods are used, as well as measurements of pressure, holography of the ear drum, measurement of interference (interferometry), and research with small animals (for example, guinea pigs).	Dr. Armand Dancer German-French Research Institute St. Louis Rue de l'Industrie 12 Weil am Rhein FRG	1974-

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Federal Republic of Germany	Investigations on Particular Hearing Defects and the Susceptibility to Noise of Those Whose Hearing is Easily Damaged This project concentrates on people with moderate hearing defects, including children.	Dr. Wolf-Dieter Keidel Institute for Physiology and Biocybernetics of the University of Erlangen-Nuremberg Universitaetsstrasse 17 Erlangen FRG	1973 to 1976
	Impact of Working Noise on Safety of the Workplace and Health of Workers in Areas With Sound-Reflecting Walls Workers in tunnel construction have a more severe noise exposure problem than other construction workers because sound reflection increases the noise emissions of the machines. Also to be contended with are carbon monoxide emissions from machines, which can lead to hearing loss in the inner ear. In conjunction with worker protection technologists and through worker health and clinical investigations, research is being carried out to gain information on the extent to which the health and safety of tunnel construction workers are being endangered.	Prof. Dr. G. Lehnert Central Institute for Industrial Medicine of the University of Hamburg Adolph-Schoenfelder-Strasse 5 Hamburg 76 FRG	1974 to 1976
	Aircraft Boom: Effect on Structures and Living Creatures Investigation of the effect of aircraft boom on the auditory system of humans and animals. Effect of startle. Simulation of boom with boom generators. Analysis using pressure pick-off, microphones, holography, and biological and biochemical methods.	Dr. Armand Dancer German-French Research Institute, St. Louis Rue de l'Industrie 12 Weil am Rhein FRG	1968 to 1976
	Medical and Psychological Studies on Noise Exposed Workers, Industrial Workers Effects of noise and age on vegetative reactions; audiometry, personality factors, attitudes.	Dr. G. Jansen Institut fur Arbeits-und Sozialmedizin Johannes-Gutenberg-Universitat Obere Zahlbacher Str. 67 D-6500 Mainz FRG	1976

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Federal Republic of Germany	Audiologic longitudinal Studies on Noise Exposed Workers During Some Years to Determine the Progression of NIPTS	Dr. U. L. Legler Universitat Heidelberg Theodor-Kutzer-Ufer D-6800 Mannheim 1 FRG	1976
	Audiologic examinations of Noise Exposed Workers Progression of NIPTS	" "	Completion 1976
	Noise Effects on the Inner Ear, Caused by Noise During Leisure Time Noise measurements in discotheques; field research in schools at Dusseldorf, audiometry and clinical examinations of pupils. (Age: 10-20).	Dr. P. L. Strauss Dr. M. Quante HNO-Klinik Universitat Dusseldorf Moorenstrasse D-4000 Dusseldorf FRG	1976-
	Audiometric Defining Between Presbyacusis and Noise Induced Hearing Impairment	Dr. Lehnhardt HNO-Klinik der Medizinischen Hochschule Karl-Wiechart-Allee 9 D-3000 Hanover Kleefeld FRG	1976 1976 to 1978
	Measurement of Sound Attenuation of Hearing Protectors Development of subjective and objective methods for the determination of sound attenuation of hearing protectors at different sound pressure levels and in various sound fields. Type testing of hearing protectors. References: Annual Report of Physikalisch-Technische Bundesanstalt	Dr. K. Brinkmann Laboratorium Fur Schallmesse der Physikalisch Technischen Bundesanstalt Bundesallee 100 3300 Braunschweig FRG	

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Federal Republic of Germany	Hearing Testing Among Employees of the Iron and Steel Industry By means of audiometric serial tests our workers were exposed to high level noise in the steel industry and on the sound intensity at the work sites. This was aimed to establish connections between noise at work locations and possible injury to hearing. Medical studies were conducted by occupational physicians and central collection and analysis of data were done by means of large computers at the institute.	Dirk Pannhausen Operations Research Institute Duesseldorf FRG	1975 to 1977
France	Damage Caused by Intermittent and Impulsive Noises Studies of temporary displacement from the noise site following exposure and auditory recovery.	Prof. Metz Center for Bioclimatic Studies Center National de la Recherche Scientifique Strasbourg, France	Ongoing
	Animal Studies	Prof. Burgeat, Dr. Loth Central Service Center of Biophysics of Lariboisiere Hospital France	
	Biochemical Mechanisms Involved in Cochlear Fatigue	J.P. Lagouix Laboratory of Neurophysiology College de France 11 Place Marcelin - Berthelot Paris - 5e France	Completion July 1978
	Special Acoustic Protectors Linked to a previous study. This study would examine problems of hearing protectors - such as physical and emotional isolation felt by users. Different types of hearing protectors can be studied: (a)protectors for impulsive and intermittent noise, (b)diffusion of cultural or recreational programs on the inside of anti-noise head-piece. (c)protectors permitting transmission of word but "stopping" the noise.	Institut National de Recherche sur la Securite Route de Neufchateau 54500 - Vandoeuvre France	1977

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
France	Effect of Metabolic Factors on Sensitivity to Acoustic Trauma	College de France 11, place Marcellin Berthelot 75231 - Paris Cedex 05, France	1977
	Biological Factors During Exposure to an Acoustic Signal	Lab Biophysique France	1977
	Appreciation of Physiological Damage Due to Noise Exposure, Based on Metabolic and Hormonal Parameters	CERMA 18, bd. Dupuy BP No. 160 01105 - Oyonax, France	1977
	Effect of Background and Pulsed Noises on Hearing Fatigue.	Commission d'Etude du Bruit Sante Publique 36, avenue Charles de Gaulle 92200 - Neuilly-sur-Seine France	1977
Japan	Establishment of Damage Risk Criteria for Conserving the Hearing Acuity (Sponsor: Japan Association of Industrial Health)	T. Toyama, Chairman Committee for Establishment of Maximum Allowable Concentration	Ongoing
	Epidemiological Study of the Effect of Super-Express Train Noise Effect on hearing acuity of school children; effect on maternal and child health.	Japan Environmental Sanitation Center 198-3 Yotsuya Kaminachi Kawasakiku Kawasakishi Kanagawa, Japan	1976-
	Epidemiological Study on the Effect of Aircraft Noise in the Vicinity of Osaka International Airport Effect on maternal and child health; effect on hearing acuity of school children; and effect on body height and weight of school children. (Sponsor: Environment Agency, Japan)	Hyogo Prefecture Japan	1975-
	Studies on the Mechanism of Adaptation of Organisms Exposed to Noise	Hiroshi Nakamoto Department of Hygiene School of Medicine Mie University Japan	

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Japan	Health Hazards of Noise Pollution	Yasutaka Osado Department of Physiological Hygiene The Institute of Public Health 1-6, 4-Chome, Shirogane-dai, Minato-ku Tokyo 108, Japan	
Netherlands	Prevalence and Prevention of Noise-Induced Hearing Loss Utilizing the so-called Noise Dosimetry, the daily noise level is calculated and expressed in the "equivalent continuous sound level." In cooperation with the ad hoc Working Group on Deafness of the European Economic Community and the Working Group 'Noise Influences' of the Committee for Industrial Medical Research, data are collected with this instrument in a great number of industrial settings. Classical noise measurements are performed as a check. Values of both methods show differences, the noise dosimeter giving a better insight into the daily noise load. By means of a detailed audiological examination the relation between exposure to noise and damage on hearing is also investigated. Up to now 15 industrial medical services have cooperated measuring over 400 work spots. Also the influence of fluctuating noise on the human hearing organ is studied, the latter being largely terra incognita.	H. E. Lindeman Netherlands Institute for Preventive Medicine TNO (Audiology Research Unit) Wassenaarseweg 56 Leiden Postbus 124 Netherlands	1975 to 1980
Norway	Investigation of Relationships Between Types of Noise Exposure and Health Hazard This project has been running for more than 3 years and involves 12 industrial companies. Around 650 employees have been checked regularly by audiometric tests and their noise environments have been measured and recorded.	J. A. Aasthen Acoustics Laboratory N-Lab Norwegian Technical Univ. Trondheim Norway	1974-

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Norway	Attempts to Derive a Physical-Mathematical Model for Hearing This project started in 1976, as a preliminary study, and is supposed to continue for a number of years. Certain relationships, which may established. Further work on the mechanics of the basilar membrane vibration is planned, and so is work studying neural excitation and damage.	J. T. Broch and H. Kringleborn Acoustics Laboratory E-Lab Norwegian Technical Univ. Trondheim, Norway	1976 -
Poland	a) Computer Diagnoses of Industrial Acoustic Trauma b) Investigations about the Oversensibility of Some People to Industrial Noise c) Ototoxic Influence of Exhalations of Gasoline	Dr. Andrzej Lepkowski Dr. Jerzy Kuzniarz Zbigniew Swierczynski Otolaryngological Department Silesian Medical Academy Katowice, Poland	Estimated completion 1980
	Investigations into the Noise Effects in Miners and Steel Workers.	Prof. J. Grzesik Institute of Professional Medicine Kieruta 20 41-200 Sosnowiec, Poland	Estimated completion 1979
	Effect of Impulse and Intermittent Noise on the Hearing Organ of Weavers	Dr. Sulkowski Inst. of Prof. Medicine Teresy 8 90-950 Lodz, Poland	Estimated completion 1979
	Studies on Ear Protectors Music as protection against the fatigue caused by noise.	Asst. Prof. Cs. Puzyna Central Institute of Work Protection Tamka 1 00-349 Warszawa, Poland	Estimated completion 1979
	Dynamics of Chronic Accoustic Trauma in Relation to Age and Concomitant Diseases	Z. Bochenek Dipl. Eng. J. Dawidowicz Research Center of Railroad Health Service Grojecka 17a 02-021 Warszawa, Poland	Estimated completion 1979

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Sweden	The Equal Energy Principle and Noise Injuries Experiments on animals (chinchilla rats) with different noise intensities and times; continued in 1976 as a study of the effects of impact noise.	Asst. Prof. Gunnar Lidén University of Gothenburg Fack S-400 33, Gothenburg 33 Sweden	1975 -
	Impulse Noise in the Construction Industry The goal of the project is to establish to what extent expositions to impulse noise contribute to the genesis of noise-induced hearing loss in the construction industry. The contribution of hearing loss due to impulse and steady-state noise among different occupational groups shall be analyzed, special risk-groups will be pointed out and appropriate outlines to reduce the risk will be drawn up. A comprehensive literature study has been carried out. Available data from the routine work of Bygghälsan, consisting of audiograms from 130,000 construction workers and noise exposition data from 180 different occupational groups are combined and statistically analyzed. In the cases where impulse noise seem to be a major factor to produce hearing loss, qualified analyses will be carried out. Preliminary results indicate that a noise exposure that contains impulsive or transient components implies a considerably higher risk than steady-state noise with the same energy content. Different types of noise impulses with the same energy content arising from work with different material seem to involve different risk degrees.	Peter Voigt Research Foundation for Occupational Safety and Health in the Swedish Construction Industry Fack, S-100 41 Stockholm, Sweden	Estimated completion December 1977

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Relation between Cochlear Potentials and Cochlear Chemistry in Noise Exposure Investigations are being carried out into the relation between the loss of cochlear potentials, following exposure to either pure tones or white noise, and the chemical changes, especially enzyme changes, in various cochlear structures as revealed by histochemical methods.	S. D. Comis, P. K. Stopp Birmingham University Neurocommunications Research Unit The Medical School Birmingham B15 2TJ England	Current in 1975 or 1976*
	Perception of Complex Stimuli Work is being done on the role of the auditory cortex in the perception of complex stimuli, using both behavioural and electro-physiological methods. In particular, a study has been made on the differences between location of a sound source under anechoic and echoic conditions. Temporal lobe damage can produce a much more severe deficit under the latter than the former condition.	I. C. Whitfield Birmingham University Neurocommunications Research Unit The Medical School Birmingham B 15 2TJ England	Current in 1975 or 1976
	Noise-induced Hearing Loss of Drop-forgers This project which commenced in 1973 has been examining the acoustic environment of GKN Forgings hammer and press shops with a view to correlating these findings with the audiometry screening programme data. Some preliminary results with particular reference to the equal energy concept have been reported. Sponsored by Medical Research Council. * All projects labelled current 1975 or 1976 are reported from "The Index of Current Noise Research in the United Kingdom 1975/1976". The present status of these projects is unknown.	H. Taylor, J. G. Kershaw Dundee University Department of Community and Occupational Medicine Medical School Ninewells Dundee DD1 9SY England	1973-

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Hearing Loss In School Children The hearing loss in two groups of school children, those aged 10-12 years, and those aged 12-15 years, is being measured. The object is to see what hearing loss, if any, there is from pop music amongst these age groups. In addition, hearing loss caused by small arms shooting and from other activities is being looked for. The work is supported by a Medical Research Council Project Grant, and is supported and helped by the Leeds General Infirmary, in particular by David Hanson.	R. W. Fearn Leeds Polytechnic Department of Architectural Studies 43a Woodhouse Lane Leeds LS2 8BN England	1975 to 1977
	Bio-acoustical Investigation into the Naturally Occurring Noise-protective Mechanism The muscle fibre composition of the middle ear muscles of selected mammals have been investigated by the application of histochemical fibre typing techniques. The results suggest that the dynamic requirements for optimal middle ear muscle contraction are different in different species. The fibre types present indicate that both muscles, but particularly the stapedius, are capable of repetitive or maintained contractions. The ability of the guinea pig to maintain contraction of the middle ear muscles is being investigated by monitoring steady-state cochlear potentials from intact ears with intradermal electrodes using a lock-in amplifier signal retrieval system. Finally a project is in hand to adapt the middle ear muscles in cotton rats for increased resistance to fatigue by exercising them acoustically.	R. Hinchcliffe, S. D. Anderson London University Institute of Laryngology & Otology 330 Gray's Inn Road London WC1X 8DA England	Current in 1975 or 1976

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Discotheque Noise, Amplified Music and Hearing Studies are being made of the effect of amplified music on the hearing of those professionally exposed and on young people who attend discotheques. An investigation has been completed with the collaboration of the Association of Professional Recording Studios which showed that the noise exposure of recording engineers in their work is not a major factor in causing loss of hearing sensitivity. Producers and performers are also being studied. The extent of temporary threshold shift, and its recovery, in attenders at a noisy London discotheque is also being measured in relation to the exposure.	J. J. Knight London University Institute of Laryngology & Otology 330 Gray's Inn Road London WC1X 8DA England	Current in 1975 or 1976
	Investigation of Patients with Noise-induced Hearing Loss Although patients with noise-induced hearing loss form only a small proportion of those attending the Associated Royal National Throat, Nose and Ear Hospital with hearing disorders, their total number over the years is considerable. Since the several successful common law actions for compensation and the acceptance in 1974 of occupational deafness (under certain conditions) as a prescribed disease under the Industrial Injuries Act, many more of these cases have required special examination. This has normally included self-recorded audiometry, speech tests, acoustic impedance measurements and electric response audiometry in order to identify and measure any non-organic components which might be present. Pre-employment and periodic re-examination of small groups of workers in various potentially noise-hazardous situations are also conducted as part of the long-term research programme into the effects of noise.	H. A. Beagley, R. Hinchcliffe, J. J. Knight London University Institute of Laryngology & Otology 330 Gray's Inn Road London WC1X 8DA England	Current in 1975 or 1976

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Discotheque Noise Recent research has aroused conflicting opinions on the contribution of loud music to hearing loss of young people attending discotheques. The current evidence is based mainly on audiometric surveys and sound level measurements. Some attempt has also been made to control sound levels by legal provisions in local acts. This has led to considerable resistance by the entertainment industry on the basis of insufficient evidence and difficulty of providing simple and effective control. The work in hand is divided into two parts. Part 1 is concerned with determining the exposure of young people to disco noise, whilst Part 2 is concerned with devising simple and effective control systems.	J. Bickerdike, Carter, Webster Leeds Polytechnic Department of Building & Civil Engineering Calverly Street Leeds LS1 3HE England	Current in 1975 or 1976
	Industrial Hearing Loss Noise surveys and hearing-loss surveys are being carried out in industry.	Mrs. J. Stone Loughborough University of Technology Department of Human Sciences Loughborough Leicestershire LE11 3TU England	Current in 1975 or 1976
	Protection Afforded by Earmuffs from Industrial Impact Noise This study involves both objective and subjective measurements on the attenuation characteristics of a variety of earmuffs to simulated industrial impact noise.	M. McRobert Salford University Department of Electrical Engineering Salford M5 4WT England	Current in 1975 or 1976

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Acoustic Trauma in Guinea-pigs and Bats after Exposure to Pure Tones Guinea-pigs and bats have been exposed to pure tones ranging from 10 Hz to 40 kHz. The intensities varied between 120 and 130 dB SPL and the exposure times ranged from 3 minutes to 9 hours. These exposures usually caused a restricted area of damage to the cochlea, except in the case of the fruit-bat, where complete destruction occurred to the whole cochlea at the sensitive region between 10 and 12 kHz. This project has now been completed except for the infrasound frequencies. A new project is being carried out where guinea-pigs are exposed to two different pure tones; a high frequency at 20 kHz and the other a lower one, either 2 kHz or 4 kHz. These frequencies are presented in either order; high frequency followed by a lower one or vice versa, with and without a recovery period between the exposures. These experiments were designed to see whether a prior exposure of the cochlea to one frequency would alter the extent or the location of the damage caused by another frequency. So far there is an indication that probably no statistical differences exist between the results of the single and the double exposures.	Ade Pye London University Institute of Laryngology & Otology 330 Gray's Inn Road London WC1X 8DA England	Current in 1975 or 1976

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Age Dependant Changes and Acoustic Trauma in the Spiral Organ of the Guinea Pig The ratio between the number of inner and outer sensory hair cells per unit length of the spiral organ in the guinea pig has been found to vary according to position in the cochlea. This information has been used to construct a cochleogram which has been used to record the normal pattern of hair cell loss in guinea pigs aged 24 hours, 6 weeks, 3 months and 1 year. Guinea pigs of three ages - 6 weeks, 3 months and 1 year - have been exposed to 4 kHz at 119 dB SPL for 2 hours. Examination by light microscopy has shown that the 6-week-old animals are more susceptible to acoustic trauma than the 1-year olds.	Ada Pye, J. W. Coleman London University Institute of Laryngology & Otology 330 Gray's Inn Road London WC1X 8DA England	Current in 1975 or 1976
	Effects of Noise on Normal Auditory Functions To date, temporal summation has been studied under a variety of masking and fatigue conditions produced by noise. Although the results are similar in many respects to earlier published work, interesting fatigue differences have appeared for short pulse durations (less than 20 ms) which warrant closer study. The masking data obtained so far do not agree with the currently proposed inhibitory feedback mechanisms. The dependence of the results on methodology is at present under investigation.	H. McRobert, M. Eyeroft Salford University Department of Electrical Engineering Salford M5 4WT England	Current in 1975 or 1976
	A Comparison of Hearing Tests on Children Using Manual Pure Tone and Evoked Response Audiometry The comparison will cover various types and causes of hearing loss in children and it may be possible to compare the results of the evoked response tests with and without mild sedation.	I. J. King South Bank Polytechnic Faculty of Environmental Science & Technology Borough Road London SE1 0AA England	Current in 1975 or 1976

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Effectiveness of Hearing Protection Against Impulsive (Gunfire Type) Noise The attenuation of impulsive noise provided by various forms of hearing protection is uncertain. More precise determinations are necessary if the effectiveness of hearing conservation programmes is to be assured. This study uses miniature microphones to measure the noise under ear muffs and helmets. These results are supplemented by measurement of small temporary changes in hearing in exposed personnel.	M. R. Forrest Army Personnel Research Establishment c/o Royal Aircraft Establishment Farnborough Hampshire GU14 6TD England	Current in 1975 or 1976
	Recommendations on Hearing Conservation Many noise situations arising in the Army have no counterpart in civil life. The aim of this study is to identify potentially dangerous situations and to develop effective means of hearing conservation.	M. R. Forrest Army Personnel Research Establishment c/o Royal Aircraft Establishment Farnborough Hampshire GU14 6TD England	Current in 1975 or 1976
	Effects of High Level Aircraft Noise On Children Residing in the Most Exposed Areas Near Heathrow Airport 100 children from the most exposed residential area near Heathrow were tested under strict control by pure-tone audiometry, and as controls children from a very quiet area were tested. The number of children with some hearing loss from the noisy area was not greater than those from the control group, that is, the numbers were about the same as those usually found in routine school audiometry.	L. Finch Heston Hearing Clinic Vicarage Farm Road Hounslow Middlesex TW5 0AJ England	Current in 1975 or 1976

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Clinical Studies of Noise-induced Hearing Loss This is a continuing long-term assessment of patients presenting with auditory symptoms in which noise is an aetiological factor, and includes audiological radiological and serological surveys, together with tests of labyrinthine functions, etc. Examinations have so far been carried out in over 250 cases. These include incidents of acute acoustic trauma as well as individuals sustaining chronic noise-induced hearing losses due not only to occupational or industrial causes but also resulting from recreational and accidental noise exposure. Particular attention is being paid to the age at which symptoms are first noticed and to retrospective histories of previous noise involvement.	D. L. Chadwick (deceased) Manchester Royal Infirmary Oxford Road Manchester M13 9WL England	Current in 1975 or 1976
	The Reaction of the Diseased Ear to Noise Conflicting reports in the published literature, for instance the question whether adhesions resulting from previous middle-ear disease protect the cochlea from the effects of noise; whether otosclerotic ears subsequently exposed to noise following stapedectomy operations are more susceptible to noise; the behaviour of cases of pre-existing sensori-neural deafness in noise, to mention only a few of the problems, indicate a considerable field for further research. Detailed studies are being carried out on pathological ears in an attempt to elucidate the particular role which various abnormal conditions of the middle and inner ear may exert on the subsequent development of noise-induced changes.	D. L. Chadwick (deceased) Manchester Royal Infirmary Oxford Road Manchester M13 9WL England	Current in 1975 or 1976

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Attenuation of Ear Protectors Methods of measuring ear protector attenuation are being studied, and a measuring system in accordance with the new British Standard (BS 5108 : 1974) has been established. The standard specifies the real-ear binaural threshold shift technique, and test signals consisting of 1/3-octave bands of noise in a diffuse field. This has been achieved by 4 non-coherent sound sources mounted in a free-field room. Comparative studies of different ear protectors have been performed, and investigations of simple objective methods are envisaged, using the subjectively calibrated ear protectors.	L. S. Whittle National Physical Laboratory Acoustics Unit Teddington Middlesex TW11 OLW England	Current in 1975 or 1976
	Noise Problems These two departments, acting either singly or in conjunction are available for the investigation of all problems relating to noise emanating from aircraft, weapons, and industrial tasks, and the investigation of noise-induced hearing loss from the same sources. Problems are investigated on an ad hoc basis. A newly-launched hearing conservation programme throughout the Royal Air Force is giving information on the incidence of noise-induced hearing loss and its distribution among various trades.	F. F. King, A. Hammerton-Fraser Royal Air Force Central Medical Establishment Kelvin House Cleveland Street London W1P 6AU England	Current in 1975 or 1976

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Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Potential Hearing Damage From Music Measurements of peak and equivalent continuous sound levels in dance halls and discotheques have shown levels that are potentially damaging to hearing. Results of hearing loss studies by many authorities however have indicated that the hazard is less than expected. Two groups of persons closely associated with the music industry who would appear to be at considerable risk are studio engineers and musicians in recording studios. Currently, digital recordings of the sound levels in control rooms have been made over periods of up to three days. These recordings have been analysed to give the L_{eq} and information regarding the statistical variation of the sound levels. It is intended that this work will be widened to explore the conditions in studios and the hearing levels of the people involved.	A. N. Burd Sandy Brown Associates 6 Fareham Street London W1V 3AH England	Current in 1975 or 1976
	Tractor Noise Studies Hearing levels (i.e. losses) measured for tractor drivers and related to noise exposure histories for comparison with published methods for estimating risk of noise-induced hearing loss. Results found to differ from expectations and require further analysis. Yet to be reported.	R. M. Stayner NIAE West Park Silsoe Beds, England	May 1976 to November 1976

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Objective Test for Hearing Protectors To develop means for measuring the true effectiveness of hearing protectors in the acoustic conditions typical of real factories. An adjustable head has been developed and is being improved which allows measurement of sound-attenuating properties of ear muffs and which can simulate not only the mean attenuation on human subjects, but also the standard deviation. The first stage of this work has been reported in Vol. 44(4) pp 545-562 of the Journal of Sound and Vibration (1976) as "OBJECTIVE TEST FOR EARMUFFS" (This paper discusses the measurement technique and validation in some detail).	M. F. Russell, S. P. May, R. E. Walford Lucas Industries Noise Centre Noise Control Group Lucas-CAV Ltd. P. O. Box 36 Warple Way, Acton London W3 7SS England	1974-

NON-AUDITORY HEALTH EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Czechoslovakia	Effect of Noise on the Vegetative Reactions of the Blood Vessels The object of our investigation was the reaction of the blood vessels of the healthy subjects caused by the acoustical stimulus of various intensity, various frequency bands. The results were compared with the vessels reactions of the group of the forge-workers-sawyers with the clinical manifestations of the vasoneurosis. In our conditions the broad-band noise gave rise to a vasoconstriction of the blood vessels in all tested persons, while the narrow-band noise reactions were not found to be clear. Persons exposed during their work to noise and vibrations together had aforementioned reactions of lower intensity but with longer recovery time compared to subjects without occupational exposure. We explain this fact by the presence of the clinical manifestations of the vasoneurosis.	Ludmila Blazekova, M.D. Institute of Industrial Hygiene & Occupational Medicine Duklianska 26 885 41 Bratislava Czechoslovakia	1976
	Effect of Noise on Nervous System The effect of noise on nervous system of man was studied using the method of auditory evoked potentials and rheoencephalography under laboratory conditions during 2 hours exposure to noise. During exposure to white noise of about 90 dB a statistically significant amplitude decrease of auditory evoked potentials was found. These changes are supposed to be the changes in vigility of the probands, nevertheless changes in hearing threshold are thought to be possible too. In the obtained rheogram an amplitude decrease was also found with the same time distribution. The trend in amplitude decrease of auditory evoked potentials as well as that of rheogram showed significant correlation. Therefore we think the changes in vigility to be possible consequences of changes in the brain circulation. Another kind of noise used in our experiments was rock & roll music. The amplitude decrease of auditory evoked potentials was found to frequencies predominating in this music. We assume that these changes are due to the change in hearing threshold.	Dr. J. Gruberova Inst. of Industrial Hygiene & Occupational Diseases Bratislava, Duklianska 2[illegible], 885 41 Bratislava Czechoslovakia	1976

NON-AUDITORY HEALTH EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Federal Republic of Germany	Investigations of Infant's Adrenal Gland Reactions to Diverse, Quantified Noise Loads Creation of physiological, psychological, sociological and economic bases for noise control, especially in the area of legislation and spatial planning as well as in the establishment of norms and guidelines in the framework of the project entitled "Effect of Noise on Special Groups of Persons Above All Children and Old People."	Prof. Dr. R. Gaedke Kinderklinik der Uni Freiburg (Children's Clinic of the University of Freiburg) Mathildenstrasse 1 Freiburg FRG	1976 to 1978
	Measurement of the Impact of Individual and Complex Environmental Conditions on Ships' Crews in Simulated Test Situations The impact of environmental influences was to be studied in simulated situations. Draftees were exposed to continuous and discontinuous standard and environmental sounds; potential for muscle movement, frequency of pulse and breathing were registered as well as the conductivity of the skin as parameters for the psychophysical effect of noise. Various tests were used to investigate the effect of noise on subjects' ability to perform and concentrate.	Prof. Dr. Ernst Effenberger Lehrstuhl fuer Hygiene der Uni Hamburg (Chair for Hygiene of the University of Hamburg) Alsterglacis 3 Hamburg 36 FRG	October 1973 to December 1975
	Noise Effects on the Heart --animal experiments (rats, dogs) --heart frequency --urine catecholamine --growth of connective tissue	Dr. H. Laind Institut fur Wasser-, Boden- und Lufthygiene des Bundesgesundheitsamtes Corrensplatz 1 D-1000 Berlin 33 FRG	1976
	Investigation of the Effect of Combined Physical and Chemical Stresses at Work Sites on the Basis of Laboratory Tests. Object is to study effects on appropriate test animals (guinea-pigs) that have hypothetical significance for man. Principal stress component	Prof. Dr. Horst Diehl Dept. of Physics and Electrotechniques of Bremen University Bremen 33, Achterstr FRG	1976 to 1981

NON-AUDITORY HEALTH EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Federal Republic of Germany (continued)	studied is noise. Other stress components contemplated are: gases (in particular CO), vapors of organic solvents, toxic dusts, vibrations. Biochemical parameters of liver and blood metabolism were chosen as indicators of evidence of synergestic effects.		
France	Noise Effects on Eye Movements	Centre d'Etudes Nucleaires de Grenoble BP No. 85 - Centre de Tri 38041 - Grenoble Cedex France	1977
	Effect of Noise on Biological and Psychosociological Characteristics	Institut Francais d'Opinion Publique 20, rue d'Aumale 75009 - Paris, France	1977
Iran	Epidemiological Survey of Occupational Exposure to Noise in Three Textile Mills 821 weavers working in three textile mills were examined in this survey. It was found that 8.5% of the workers were hypertensive and 12.4% borderline. All these rates are significantly different from those of the control groups. Also there is a clear increase in the prevalence of hypertensive and borderline cases in the weavers in relation to the length of employments. These findings emphasize the need for, at least annually, periodic examination of the entire work population in order to detect early such adverse health effects and to consider suitable medical care.	Daryoush Parvizpoor M.D., D.I.H. Dept. of Occupational Health Univ. of Tehran School of Public Health Tehran, Iran	Study published in 1976
Italy	Urban Traffic Noise, Cardiocirculatory Activity and Coronary Risk Factors The effects of traffic noise on blood pressure, heart rate, electrocardiogram, blood chemistry, and urinary catecholamines were studied in 33 male subjects aged 20 to 70 years.	L. Verdun di Cantogno Dept. of Audiology & 1st Dept. of Medical Pathology Univ. of Turin Turin, Italy	Study published in 1976

NON-AUDITORY HEALTH EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Italy - (continued)	Traffic noise caused increased blood pressure and heart rate, and altered the blood chemistry such that this type of noise stress may be a coronary risk factor and may be involved in the development of arteriosclerosis. Blood chemistry data was too small to make definite conclusions, however.		
Japan	Health and Social Effects of Aircraft Noise in the Vicinity of the Osaka International Airport a) Effects on behavior and body weight of new-borne babies and infants b) Community reaction to the noise using questionnaire c) Social effect and cost of the airport	Drs. J. Maekawa, Y. Ando H. Hattori, & S. Komori Faculty of Engineering and of Medicine Kobe Univ. Kobe, Japan	1972-
	Effects of Noise on Human Placental Lactogen Levels in Maternal Plasma The levels of human placental lactogen (HPL) in the serum of expectant mothers both subjected to and not subjected to aircraft noise were measured. The HPL levels in the quiet reference area and in the noise area were similar before the 29th week of pregnancy However, the HPL levels of subjects in the noise area tended to be lower than those in the reference area after the 30th week of pregnancy and the difference became significant after the 36th week of pregnancy The lower HPL levels were associated with lower birth weight for infants of mothers who lived in the noise area. Ando, Y., and Hattori, H. (1977). "Effects of Noise on Human Placental Lactogen (HPL) Levels in Maternal Plasma", Brit. J. Obstet. Gynaecol. 84. 115-118 Ando, Y. (1977). "Effects of Noise on Duration Experience", to be published.	Dr. Y. Ando & Prof. H. Hattori (same address as above)	1969 to 1977

NON-AUDITORY HEALTH EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Japan	Effect of Noise from Super-Express Train of Shinkansen Railway on Human a) Experimental evaluation of loudness of train noise b) Effect on sleep, peripheral circulation, and adrenal function of man c) Effect on speech intelligibility d) Effect on mental performance e) Bibliographic study on the health effect of noise.	Drs. T. Yamamoto, S. Sakuma, Y. Onada, & H. Yoshida Japan Assoc. of Public Health	April 1973 to March 1975
	Response of Finger Pulse Amplitude to Intermittent Noise Reduced fingertip pulse amplitude in response to noise is an accurate physiological index of noise effects and indicates noise-induced sympathetic nervous tension. The finger pulse amplitude response is non-specific.	C. Ohkubo, K. Miyazaki, Y. Onada Dept. of Physiological Health Inst. of Public Health Tokyo, Japan	Study published in 1976
	Adult Emergence and Longevity of Flies (Drosophila Melanogaster) under Noise Environments. Four strains, which have homozygous second chromosomes extracted from a natural population of Ishigaki-jima in 1973, were used in this experiment. Many eggs, laid by many female flies for 12 hours, developed under unicircadian rhythmic white and pink or 2000 cycle pure noise (NQ, NQ 4:4, 8:8) 100 phon, constant dark (DD) and temperature (25.C) environments. The total number of flies which emerged under noise environments was found to be fairly more than that under noiseless environments. .The stimulus of white and pink noise was assumed to be stronger than pure noise. The noise accelerated remarkably the developmental rate of larvae and pupae, and also the aging of adult flies. Longevity of adult flies was clearly reduced by the noise in addition to constant dark and temperature environments.	Chozo Oshima, Lee Won Ho, Takatada Kawahara, and Toru Fujishima National Institute of Genetics Mishima, Japan	1974 to 1978

NON-AUDITORY HEALTH EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Japan - continued	Epidemiological Study of the Effect of Super-Express Train Noise a) Effect on hearing acuity of school children b) Effect on maternal and child health	Japan Environmental Sanitation Center 198-3 Yotsuya Kamimachi Kawasakiku Kawasakishi Japan	1976-
	Epidemiological Study on the Effect of Aircraft Noise in the Vicinity of Osaka International Airport a) Effect on maternal and child health b) Effect on hearing acuity of school children c) Effect on body height and weight of school children	Hyogo Prefecture	1975-
	Hypothalamo-Hypophysial-Adrenal Response to Noise	H. Arizono, N. Iwamoto, & J. Osaki Dept. of Hygiene School of Medicine Yamguchi University Uba, Japan	
Poland	Extra-Auditory Effects of Noise on Weaving Mill Workers in a Textile Industry Factory The incidence of high blood pressure, neurosis and gastric ailments were studied in two groups of workers from a weaving mill factory and a spinning mill factory, and correlated to occupational factors. The workers in the weaving mill who were exposed to higher noise levels, 90 dB and above were found to have a greater incidence of illness. Ref: Cieslawicz, J. Medycyna Pracy XXVII, 1977,5.	Jerry Cieslawicz 4th Circuit Industrial Clinic Lodz, Poland	Paper published in 1977
	The Effect of the Acoustic Microclimate in the Shipyard on Disturbances in the Worker's State of Health 1,826 out of a population of 7,651 shipyard workers were exposed to high levels of noise. Checking medical records, the noise-exposed employees were found to have far more hearing disorders, and also greater incidence of high blood pressure, ulcers, and neuroses. Ref: Pilawska, H. et al. Medycyna Pracy XXVIII,'77,5	H. Pilawska, T. Mikulski, J. Ronin, M. Soraka, K. Hynocki PAN Health Institute Szczecin, Poland Shipyard Society for Health Maintenance	1975

NON-AUDITORY HEALTH EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Sweden	Physiological and Medical Effects of Noise In relation to circulation, central nervous system, kidney, reproduction system.	Ange Möller The Karolinska Institute Pyniology Dept. S-104 01 Stockholm 60 Sweden	1976
	Prolonged Exposure to a Stressful Stimulus (Noise) as a Cause of Raised Blood Pressure in Man. Systolic and Diastolic blood pressure was significantly higher in 44 male industrial workers with a noise-induced auditory impairment (-65 dB at 3000, 4000, or 6000 Hz) than in 74 males of the same age with normal hearing. Moreover, significantly more individuals with hypertension (resting recumbent blood pressure greater than 160/100 mm Hg) were found in the group with noise-induced loss of hearing. It is suggested that repeated and prolonged exposure to a stressful stimulus (industrial noise severe and prolonged enough to cause a permanent loss of hearing at the relevant frequencies) may be a contributing factor to the rise in blood-pressure through a mechanism involving structural adaptation of blood vessels in response to repeated peaks of raised blood pressure. Johnsson, A. and L. Hansson. The Lancet 1(8002): 86-87, Jan. 8, 1977.	Anders Jonsson Volvo Inc. Gothenburg, Sweden Lennart Hansson Dept. of Medicine I Sahlgren's Hosp. S-41345 Gothenburg, Sweden	Study published in 1977
	The Effect of Infra Noise on Humans (Biological Life) A working party will be set up including physicists, biologists, electrotechnicians and chemists.	Prof. Gunnar Hambraeus The Academy of Eng. Sciences	1976 to 1977
	Experimental and Epidemiological Studies of the Effects of Infrasonic Noise on Man The aim of the project is to study effects of long term exposure to infrasonic noise on the human organism at intensities ranging from 90 to 120 dB. Somatic and psychological effects will be studied under controlled conditions, and personnel exposed to infrasonic noise in their work will be studied.	I.M. Lidstrom, L. Liska National Board of Occupational Safety & Health Sweden	1976

NON-AUDITORY HEALTH EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Physiological Correlates of Noise This is an ongoing project in which physiological responses to specific localised noise stimuli are used as a means of determining the effects of various background environments on the individual. Physiological responses - i.e. transient changes in skin conductance, heart rate, respiration and peripheral blood flow - are compared across different background levels of noise. Various aspects of the responses are of interest, in particular response amplitude, the time taken to return to base level after each response, the rate at which the responses decline with repetitions of the stimulus, and the reappearance of the responses when a change in the stimulus is noticed. Measures such as these should allow an evaluation of background environments to be made in the context of individual physiological activity.	R.G. Hopkinson, T. Lobatc O.G. Edholm, R. Webb, J. Cort London Univ. University College School of Environmental Studies Wates House 22 Gordon Street London, WC1H 0QB England	In, Current in 1975 or 1976
	Cardiovascular Responses to Short Duration Sound The nature of changes in heart-rate and peripheral blood content consequent to auditory stimuli of moderate intensity is being investigated and the possibility of a differential digital vasoresponse to such stimuli is being investigated. Development of a theoretical model which sees the specific psychophysiological response to short duration sound as the outcome of an internal statistical decision process is being undertaken and experimentally tested. The possibility that a non-auditory, cardiovascular, response to sound may differentiate between individual's susceptibility to noise is being considered.	M. Oldman Sheffield Univ. Dept. of Building Science Western Bank Sheffield S10 2 TN England	Current in 1975 or 1976
USSR	Effect of Acoustic Stimulation on Lipid Metabolism Indices of the Blood Coagulation System & Development of Experimental Atherosclerosis in Rabbits Noise stimulation caused increased levels of non-esterified fatty acids and blood coagulation factors (hypercoagulation). Hypercoagulation was enhanced by cholesterol feeding. Noise alone induced microscopic arterial necrosis and other atherosclerotic changes to a lesser degree in rabbits exposed to noise for 18 days than in those exposed for 14 days.	G.P. Daryagina, T.S. Sinitsina, T.V. Vasclova Pavlov's Inst. of Physiology Acad. Sci. USSR & Inst. for Experimental Medicine Acad. Med. Sci. Leningrad, USSR	Study Published in 1976

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Canada	A Laboratory Study of Annoyance Due to Traffic Noise and the Choice of Noise Descriptors The project goal was to formulate objective descriptions of traffic noise which correlate best with the annoyance it produces, so that noise impact assessment, noise standards and noise control can all proceed on a firm footing. The approach was to ask subjects to judge annoyance of a number of 2-minute segments of traffic noise presented to them while they relaxed in living room conditions listening to recordings of Reader's Digest Articles. The equivalent sound level, Leq, was found to correlate more highly with subject's annoyance measured on a subjective scale than a number of other noise descriptors and subject variables. The experiment therefore confirms the use of Leq as a single, governing variable in determining the annoyance due to traffic noise.	C. Andrew, D.N. May Acoustics Office, R & D Division Ministry of Transportation & Communications 1201 Wilson Ave. Downsview, Ontario M3M 1J8 Canada	December 1975 to March 1977
Federal Republic of Germany	Effect of Noise on Particular Groups of People, Especially Children and Old People Basic research in the area of noise protection. Creation of physiological, psychological, sociological and economic bases for noise control, especially in the area of legislation and in spatial planning as well as in work involving the development of norms and guidelines.	Dr. P. G. Jansen Institute for Health & Industrial Medicine of the Univ. of Essen Hufelandstrasse 55 Essen FRG	January 1973 to December 1976
	Measurement of the Impact of Individual & Complex Environmental Conditions on Ships' Crews in Simulated Test Situations The impact of environmental influences was to be studied in simulated situations. Draftees were exposed to continuous and discontinuous standard and environmental sounds; potential for muscle movement, frequency of pulse and breathing were registered as well as the conductivity of the skin as parameters for the psychophysical effect of noise. Various	Dr. Ernst Effenberger Chair for Hygiene of the Univ. of Hamburg Alsterglacis 3 Hamburg 36 FRG	October 1973 to December 1975

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Federal Republic of Germany (continued)	tests were used to investigate the effect of noise on subjects' ability to perform and concentrate.		
	Superposition of Noise and Unilateral/Dynamic Work in Regard to Fatigue/Recuperation Aim: Fatigue and recuperation in unilateral intensive muscular labor with/without noise-induced stress. Methodology: use of ergometer, measurement of performance by mechanical activity, different electromyograms and heart rate with/without exposure to noise.	Klaus Martin Inst. for Labor Studies Darmstadt, Petersenstr. 18, FRG	1974-
	Information Processing and Noise Relaxation and Noise	Dr. Wolfgang Schonpflug Inst. fur Psychologie Der Freien Univ., FRG	1978
France	Two Wheeled Vehicles Defining the nuisance caused by two-wheeled vehicles of low capacity is important because there are 6,000,000 such vehicles in France, and they are very common in the cities. A 1976 documentary study on noise from two-wheeled vehicles and a laboratory study on noise from motors of various capacity were made.	G. Packinadi, M. Vernet Institut de Recheiche des Transport France	1977
	Differential Psychology of Annoyance Due to Noise		1977
	Analyzing Annoyance by the Method of Acoustic Tests	Societe d'Etudes pour le Developpement Economique et Social 27, quai Anatole France 75007 - Paris, France	1977
	Objective Versus Subjective Variations	Hosp. Neuro, Lyon France	1977

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
France	Psychoacoustic Study of Impulse & Pure Noises	Societe Nationale Industrielle Aerospatiale 37, boulevard de Montmorency 75016 - Paris, France	
	Feasibility Study of Statistical Analysis of Noise in Dwellings	Centre d'Etudes du Batiment et des Travaux Publics 12, rue Brancion 75737 - Paris Cedex 15, France	
Italy	Subjective Characters of Sound Impulse Duration	National Electronic Inst. Fisiol. Verter. Fis. Biol. University Italy	1975
Japan	Estimating of the Effects of Noise on Learning The investigator will study the effects of various noise on learning (mental calculation, memory, etc.) and rate noises psychologically (by magnitude estimation method). Simultaneously with such experiments, time of mental calculating will be measured and the relations between the time and psychological ratings will be compared.	Takumasa Yoshida The Institute of Public Health 6-1 Shirogandai 4 chome minato-ku Tokyo, Japan	March 1976 to March 1978

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Japan	Pschyological & Physiological Effects of Fluctuating Noise - A Random Walk Model of Loudness Discrimination In the psychophysics the constant method is usually to process the proportion of response category and to estimate PSE (point of subjective equality), and DL (difference limen). We measured the reaction time in the loudness discrimination test to find information about the process of discrimination.	Hisashi Kado, Shozo Hattori Electrotechnical Laboratory	1973 to 1977
	Effects of White Noise on the Learning Performance of Mice Effects of white noise (100 phon for 8 hours every night) on the discriminated avoidance, avoidance and discrimination performances of mice of C3H/HeMs strain which showed the best learning ability among several inbred strains in the previous experiment, were investigated with an automated Y-maze apparatus, using buzzer and lamp as the conditioned stimulus and electric shock as the unconditioned stimulus. A remarkable depression in the performances, especially of avoidance, of mice was observed after one week exposure to the noise enviroment, but such a depression disappeared after three weeks exposure to the noise environ-	Chozo Oshima, Lee Won Ho Takatada Kawahara & Toru Fujishima National Inst. of Genetics, Mishima, Japan	1974 to 1978
	Effect of Loud Noise on Human Performance Efficiency & Interaction with Other Stressors		
New Zealand (A)	Sleep Loss, Noise and Decisions This project carried out a more sophisticated analysis of the antagonistic interaction between sleep-loss and noise in man's performance. Results showed that there was no true antagonism, but rather that noise decreased suspended judgments and increased negative decisions when little evidence was available. Sleep loss, in contrast, increased positive decisions when a good deal of evidence was available, but also increased suspended judgements at high levels of evidence. This means that both stressors of sleep loss and noise decrease suspended judgements and increase precipitate decisions but will also cancel out each other's effects in the middle of the range of evidence.	Dr. L. R. Hartley Dept. of Psychology Univ. of Otago P O Box 56 Dunedin, New Zealand For further information on these projects contact: Dr. L.R. Hartley Dept. of Psychology Univ. of Leicester University Road Leicester, England	1977 (Projects A,B,C,D are completed & either in press or under submission)

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
(B)	Steady State Noise, Music and Vigilance This experiment was a re-analysis of McGrath's (1962) experiment involving variable or homogenous auditory stimulation during prolonged visual detection performance. The results showed that variability of noise does indeed prevent the decline in detection and performance and this effect is restricted to cautious performance at high levels of evidence, where the decline is located. This form of improvement is, however, accompanied by a diversion of attention towards the source of variability. Accordingly, optimization of performance will depend on balancing task demands, in particular probabilities, with environmental variability.	(same address as previous page)	completed
(C)	Deafness, Annoyance and Stress This is a brief review work of the major factors in noise annoyance and stress. It is concluded that the respondent's personality is of little importance compared to his attitudes and education, in his response to noise annoyance. The analysis of the adverse effect of noise on performance is discussed.	(same address as previous page)	completed
(D)	Behavioural Antagonism between Noise and Chlorpromazine This most recently completed study shows that the increase in negative decisions taken in noise, is reduced to normal levels by low dose of chlorpromazine. Chlorpromazine alone, however, seems to affect performance very much like noise does. Ameliorating the long-term adverse effects of noise by chlorpromazine administration may be practically useful.	(same address as previous page)	completed

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
New Zealand(E)	(Work to be Completed but in Progress) Recently, some workers have suggested that the masking effects of noise may play a larger role in adversely affecting performance in tasks without an obvious auditory component. Studies of the role of masking in visually based tests is under way. In addition, replications of the value of subjectively perceived control of the noise level, in ameliorating the adverse effects of noise are under way, in a variety of tasks.	Dr. L. R. Hartley Dept. of Psychology Univ. of Otago P. O. Box 56 Dunedin, New Zealand	1977-
Norway	Attempts to Derive a Model for Noise Nuisance (Noise Only) The project will start in 1977 and continue. A first model will be based on ideas set forth by D.W. Robinson in 1972, and eventually modified to take into account factors such as frequency weighting and pure-tone and impulse-weighting.	J.T. Broch & T. Gjestland Acoustics Laboratory E-Lab Norwegian Technical Inst. Trondheim, Norway	1977-
Poland	An Accoustic Evaluation of Automatic Vehicles from the Point of View of the Noise and Vibrations Influence on Driver's Work This study investigates the acoustic conditions inside trucks and buses operated at National Motor Transport Enterprise, and the effects of noise on the drivers performance. Road tests, and simulated laboratory studies are being done. The acoustic climate will be determined and methods for abating noise will be explored. Results will help to set standards. Safe and practical inspection techniques will be developed.	Dr. C. J. Maiaga Instytut Transportu Samochodowego 40 Stalingradzka St. 03-301 Warsaw, Poland	1976 to 1978

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Sweden	Annoyance Reactions to Noise To study the relationship between annoyance caused by noise exposure, and the effects of noise on the physiological status of performance. In order to study the validity of reports of annoyance as a measurement of negative effects of community noise, the relationship between reports of annoyance and reports of other effects, such as activity disturbances and psychosomatic symptoms etc., has been studied. The strong correlation that was found is no definite evidence of high validity, however, since the same errors could have affected both the variables. The results did not show any effects of the noise, neither on the average excretion of cathecolamines nor on performance in the different test groups. However, the subjective experience of stress increased when the subjects worked with the arithmetic test during noise exposure. The main result of the study was the evidence of a relationship between the effect of noise on performance and the experience of annoyance and noise effects on performance.	Ola Arvidsson Dept. of Environmental Hygiene Karolinska Institute S-104 01 Stockholm 60 Sweden	1973
	Individual Dose - Response Relationship Certain measures must be taken in order to control satisfactorily different types of noise sources as well as to create an acceptable living environment based on our knowledge of the relationship between exposure and the occurence of different reactions. In practical public health work, data based on "standard reaction" and "standard exposure" is used, but this kind of data is not satisfactory when trying to explain an individual person's reaction to noise.	Stefan Sorensen Dept. of Environmental Hygiene Natl. Swedish Environment Protection Board Snidenzagen 5 17120 Solna Sweden	1975 to 1976

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Sweden (continued)	It is necessary to obtain information to determine under what circumstances disturbance occurs with regard to individual projections. Personal interviews have been conducted and about 500 descriptions of individual exposure have been collected (from twins).		
Switzerland	Traffic Noise and Annoyance in a Laboratory Condition Traffic noise was recorded in different distances and with different traffic densities. In an auditorium, 100 subjects were exposed to these different traffic noises and the degree of annoyance was determined. The correlation between annoyance and 11 different noise rating procedures was calculated. The best correlation was found for the equivalent noise level Leq. Traffic Noise and Annoyance in a Laboratory Condition, by P. Voigt, T. Pollu, A. Lauber, J. Nemack, and R. Grandjean. Zschr. Sozial und Praventivmed., 19, p. 197, 1974.	P. Voigt, T. Pelli, A. Lauber, J. Nemecek & E. Grandjean Dept. of Hygiene & Ergonomics Swiss Federal Institute of Technology Zurich, Switzerland	

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Psychological Correlates of Noise In parallel with a physiological study by the same authors, various personality and mood factors are being investigated in relation to noise. It is intended to monitor various mood and personality dimensions in relation to exposure to different levels of noise and different durations of such exposure. It is hypothesized that there will be not only the more predictable changes in mood under the more noxious conditions, but that there might also be certain changes in what are supposed to be relatively stable personality characteristics. This would be of some interest to the general field of personality measurement, as well as being important in the prediction of behaviour under noisy conditions, and increase our understanding of the long-term effects of noise on mental health.	R.G. Hopkinson, T. Lobstein, O.G. Edholm, R. Hebb, J. Cort London Univ. Univ. College School of Environmental Studies Water House 22 Gordon Street London WC1H 0QB England	Current in 1975 or 1976
	Effect of Pure Tones on Human Performance The internal sound level of a building is usually specified by the Noise Criterion or Noise Rating number. These were derived from experiments carried out using broad-band sound, the effect of which was assessed for particular groups of people. It is known that tonal characteristics, due to the blade passage frequency of a fan for example, can be distracting or annoying even if the NR criterion is satisfied. The NR curves are mainly concerned with the loudness of noise over all frequencies whereas annoyance to noise depends not only on this attribute, but also the presence of tones at particular pitches, the number of tones, their duration and intermittency and their information content. If a sound is known to have a significant tone 5 dB is added to the NR number in an attempt to mask it. The validity of this design procedure was checked by carrying out experiments on eight different classes of students exposed to noise, which included 80 Hz (at amplitudes of 67 or 73 dB), 160 Hz (at amplitudes	D.J. Croome-Gale Loughborough Univ. of Technology Dept. of Civil Engineering Loughborough Leicestershire LE11 3TU England	Current in 1975 or 1976

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organisation	Project Duration
United Kingdom	of 55 dB or 64 dB), 315 Hz (at amplitudes of 59 dB or 65 dB) or 630 Hz (at amplitudes of 50 or 54 dB) tones during the duration of a one hour lecture. A Wilcoxon matched-pair signed rank test was used to discover the significance of the thermal, visual or acoustical environment on annoyance and distraction.		
	Effects of Moderate Level Noise Upon Tasks Involving Auditory Imagery The purpose of this project is to find effects on working efficiency from relatively low levels of noise, since most reports of deleterious effects have previously found very high intensities to be necessary. Preliminary results have shown some effects from levels of 80 dB or so, upon the organisation of memory, on vigilance detection which involves such memory, and also side effects upon mood and motor control when attempts are made to carry on conversation against such moderate noise levels.	Dr. D.E. Broadbent Oxford Univ. Dept. of Experimental Psychology South Parks Road Oxford OX1 3UD England	Completed by October 1979
	The Subjective Assessment of Loudness and its Relation to Physiology and Personality An investigation into the subjective estimation of loudness by a large group of normal observers has shown significant inter-individual differences. Work is now in progress to examine possible correlations between individual loudness performance other physiological measures of hearing, evoked electrical responses, and personality. The work has demonstrated a statistically significant relationship between individual loudness assessments and measures of creativity.	W. Tempest, C.N. de Barbensa, F. Ahmed Salford Univ. Dept. of Electrical Eng. Salford M5 4WT England	Current in 1975 or 1976

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Human Reaction to Noise from Single Vehicles A laboratory facility has been set up which will allow recordings of vehicle noise to be played back to a group of observers. The facility will handle a vehicle-noise spectrum in the frequency range 2 Hz to 10,000 Hz. A series of recordings have been collected of passby noise and interior noise of trucks, buses, vans and cars. A subjective test programme is underway to determine whether measurements in terms of existing noise units like dB(A) etc., adequately reflect human reaction to these vehicle noises when the low frequency and infrasonic content of the noise is included in the evaluation.	N.S. Yeowart, N. Tempest, P. Barker, P. Shead Salford Univ. Dept. of Electrical Eng. Salford M5 4WT England	Current in 1975 or 1976
	Studies of Noise Sensitivity Research in the area of noise annoyance includes a comparison of the response to general environmental noise of 200 University students, chosen at random as controls, with that of a group of 200 (self assessed) noise sensitive members of the community. Both groups completed the same questionnaire concerned with determining relative concern about noise, attitudes towards it, effects upon health, general interests and characteristics. Both groups also completed various personality questionnaires. Preliminary results confirmed that noise has a greater impact upon the sensitives than the controls and 28% of the former claim it has caused ill health compared with none of the latter. A substantial majority of the noise sensitives have also moved house or changed employment because of noise. Some earlier laboratory studies, which indicated that noise sensitive people tended to be more creative and to show more empathy than others has been confirmed.	Dr. M.E. Bryan Univ. of Salford Audiology Group Electrical Eng. Dept. Salford M5 4WT England	1976 to 1977

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Noise Sensitivity in Children As an extension to the work on noise sensitivity in adults an examination has been made of the incidence of this characteristic in children. Laboratory studies have suggested that creative, intelligent subjects are most likely to be bothered by noise. With the help of the National Association of Gifted Children the response of some of its members to noise is being compared with a control group of 10-11 year old school children of normal ability.	M.E. Bryan Salford Univ. Dept. of Electrical Eng. Salford M5 4WT England	Current in 1975 or 1976
	Preferred Noise Levels Whilst Carrying out Mental Tasks The results of two experiments are reported in which 55 university staff and students carried out a variety of mental tasks and were required to adjust their ambient noise to a "comfortable working level". Preferred listening levels whilst carrying out mental tasks in noise show very large between-subject differences. Some subjects prefer to work in the quiet and others in "deafening" noise levels (over 90 dB(A)) and yet the latter suffer no deterioration in task performance compared with the former. Preferred listening levels are determined in part by (1) the type of noise, (2) the degree of task difficulty and (3) the personality traits of extroversion and psychoticism, and possible by noise sensitivity. Such personal differences as sex, age and "status" of the subject do not apparently affect preferred listening levels. These levels are shown to be those at which subjects judge a noise over which they have no control to be between "quiet" and "noticeable". Results published: Journal of Sound and Vibration (1976) 45, 139-156. M.E. Bryan & D. Tolcher.	(same as above)	Completed in 1976

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Subjective Responses to In-Cab Heavy Goods Vehicle Noise Subjective reactions of the relative annoyance to in-cab recordings of various heavy goods vehicles are being investigated. Correlations between subjective preferences and various objective indices of noise level are being sought and a relationship between expressions of relative annoyance and a statistical description of vehicle noise environment is being studied. Annoyance judgments for several phases of vehicle operation and loading are being elicited for incorporation in the comprehensive description of vehicle noise acceptability to be attempted.	S. Kamath, M. Oldman Southampton Univ. Inst. of Sound & Vibration Research Southampton SO9 5NH England	Current in 1975 or 1976
	The Stability and Distribution of Loudness Balances The present research has shown that the concept of a simple loudness function relating equated loudness between qualitatively dissimilar stimuli is statistically dubious since the average group result does not adequately reflect the bimodal distribution of loudness judgments elicited from a group of subjects. It has been shown, however, that repeated judgments of similar stimulus pair presentations are stable over time and it is believed that the stable bimodality of loudness balance judgments reflects an inadvertent attention, on behalf of some subjects, to judge noisiness rather than loudness.	P. Dormar, M. Oldman (same address as above)	Current in 1975 or 1976
	Investigations of the Trade-Off Effects of Aircraft Noise and Number The development of a simulated domestic listening facility has enabled the investigation of the trade between aircraft noise and number in the laboratory. To date, 200 subjects in groups of four, have been exposed to various combinations of aircraft noise	C.G. Rice, M. Oldman, I. Ward (same address as above)	Current in 1975 or 1976

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	level and density under the simulated "at home" conditions, in sessions of one hour duration. Responses to the total sessions have been gained using comprehensive questionnaire techniques and relationships between elicited responses and the continued noise environments are being sought.		
	Noise Masking and Auditory Filter Shape When a person is asked to detect a signal in the presence of noise, it is assumed that he centres a neurological filter at the signal frequency which assists him by selectively attenuating the noise and thereby improving the signal-to-noise ratio of the stimulus on which he bases his decisions. A wideband noise with a sharp notch is being employed in masking experiments with humans to determine the amplitude characteristic of the assumed auditory filter. At present it would appear that a Gaussian function provides a fairly good approximation to the filter shape and the 3 dB bandwidth of the filter at 1.0 kHz is about 140 Hz. This is an ongoing project, part of which has appeared in the Journal of the Acoustical Society of America.	R. D. Patterson Medical Research Council Applied Psychology Unit 15 Chaucer Road Cambridge CB2 2EF England	Current in 1975 or 1976
	How Noise Affects the Efficiency at Work It is sometimes claimed that noise has a direct detrimental effect upon work which is distinct from arousal and masking. We aim to determine whether it is necessary to believe in this third effect. Arousal and masking may be perfectly adequate on their own to explain all the effects of noise.	E.C. Poulton (same address as above)	

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	The Effect of Low Frequency Noise upon Working Efficiency In an experiment on the interaction of low frequency noise and mild heat, the low frequency noise by itself reliably improves performance on all the 3 tasks used. This could be due to an interaction with the heat. An experiment using groups of volunteers for each condition is required to check on this.	E.C. Poulton, R.S. Edwards Medical Research Council Applied Psychology Unit 15 Chaucer Road Cambridge CB2 2EF England	projected
	Performance in Noise and Subjective Reactions to Noise In community noise surveys, noise is said to be annoying or intrusive. Yet there is some evidence that in an experiment low frequency noise may improve performance. It is aimed to determine the subjective reaction to low frequency noise when it improves performance.	E.C. Poulton, R.S. Edwards (same address as above)	projected
	Comparative Studies of Accidents in Industry Long-term continuous observation was used to monitor environmental conditions, details of the work and of the people in a variety of workshops. Accidents were investigated as they occurred. Each victim and situation were compared with a control person and a control situation. People were generally unconcerned about noise, despite levels up to 100 dB(A). No direct connection between noise and accidents could be demonstrated. Work was completed in four workshops and started in a fifth. It is now in abeyance owing to lack of funds.	P.I. Powell, M. Hale, J. Martin, M. Simon Natl. Inst. of Industrial Psychology Accident Research Team c/o N E L P Livingstone Road London E15 2LJ England	Current in 1975 or 1976

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Subjective Effects of Exposure to Noise Subjective reactions to noise (annoyance, irritation, intrusion, etc.) have proved difficult to observe or measure. This project continues previous work and is intended to develop a number of techniques for testing the subjective effects of exposure to noise in a controlled laboratory environment. The techniques being studied include observations of behavioural reactions, use of attitude scales, and comparison and adjustment methods. The object is to identify the acoustical factors which contribute to the reaction and so to develop noise rating scales which adequately represent this reaction.	H.C. Fuller & R.F. Higginson Natl. Physical Laboratory Acoustics Unit Teddington Middlesex TW11 OLW England	1975
	Noise Rating Scales Work is in hand to provide a systematic assessment of various "unified" noise rating scales. Scales to be assessed include those currently in use (eg Leq), LNP and derivatives, and others which are under development dealing in different ways with the fluctuating characteristics of environmental noise. The assessment will be in terms of the fundamental requirement of concurrence with human response to noise and in terms of practical requirements such as measurability, predictability, etc. A study of the inter-relationships between the various scales will be undertaken.	B.F. Barry & D.W. Robinson (same address as above)	Current in 1975 or 1976
	Rating Helicopter Noise There is a need to quantify the characteristic impulsive noise of helicopters so that, in the event of an extension of aircraft noise certification to include these types of machines, the noise unit used reflects the additional annoyance commonly ascribed to such noise. A physical measure has been found which correlates satisfactorily with the subjective assessment of the degree of blade slap present in the noise. A programme of	B.F. Barry, A.J. Rennie, H.C. Fuller, R.F. Higginson (same address as above)	Current in 1975 or 1976

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom (continued)	subjective experiments is being conducted to evaluate the perceived noisiness of helicopters operating in a range of conditions.		
	Urban Environment Simulation The objective is to discover the values that people place on variations in their home environment that result from road and traffic changes. The method involves tests of peoples response to a simulated lounge and variable external environment. A progress report describing the pilot studies has been published.	R.F.F. Dawson Transport & Road Research Laboratory Environmental Division Crowthorne Berkshire RG11 6AU England	1970-
	Investigation of Effects of Noise on Driver Performance in Commercial and Off-Highway Vechicles An investigation with particular interest in loss of concentration and fatigue, i.e. loss in road safety.	D.R. Winterbottom N.A. Grundy Sound Research Laboratories Ltd. England	Current in 1975 or 1976
	Aircraft Noise and Psychiatric Morbidity A study of admissions to large psychiatric hospitals in order to clarify, in a large scale survey, the relationship suggested by previous work, that admission rates from the higher noise zones close to Heathrow Airport may be higher than from relatively quieter areas. The type of patients considered in this study have fairly severe and disabling forms of mental disease. A field survey of minor psychiatric disorders and the use of medical services in relation to noise exposure and noise annoyance in order to study the association of noise exposure and noise annoyance with mild and more common forms of psychiatric disorder than the ones considered in the above study. The use of medical and social services and of medications is also being studied.	A. Tarnopolsky, R. Wiggins, S. Barker Inst. of Psychiatry London England	1973 to 1978

PSYCHOLOGICAL AND PERFORMANCE EFFECTS

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom (continued)	The distribution of the health variables across noise zones and their association between themselves, with annoyance, and with personal, familial, demographic and sociological variables will be analysed. A pilot field survey was carried out during 1975 and will be published this year. Pollution, noise and mental health M. Shepherd, The Lancet, Vol. 1, 322, 1975		

NOISE EFFECTS ON SLEEP

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
E.E.C. Germany France Netherlands United Kingdom	Effects of Noise on Sleep and Psychological Performance The project will be achieved jointly by four research institutions of the European Community in Germany (Mainz, France (Lyon), Netherland (Delft), and United Kingdom (Cambridge). The project leaders have defined a common procedure with minimum requirements to be followed by every team. Some experimental points are to be decided by each team in such a way to allow the pooling of all results. It is expected to start the registration of physiological parameters during sleep at home in November 1977 and to get at least 80 - 100 sleep records at the end of January 1978, in each country. An intercomparison of different ways of scoring the EEG and ECG will be performed and a preliminary analysis of these 300 - 400 nights should be made before July 1978. The complete project will not be finished before the end of 1978. According to the results of this first phase, an extension, modification or halt of the project might be decided in the second half of 1978. For further information see the next two pages.	B. Griefahn Institut fur Arbeitmedizin Mainz, Germany M. Vallet Institute Recherche Transports Lyon, France A. Jurriens Technisch Physische Dienst Delft, Netherlands R. Wilkinson Medical Research Council Cambridge, England	1/77 to 12/78

NOISE EFFECTS ON SLEEP

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Canada	Effect of Noise on Sleeping Persons The disturbance of sleep is generally considered to be one of the more important effects of environmental noise. The purpose of this project is to determine quantitative relationships between sleep level and noise exposure for human populations. During the past eight years more than 80 sleeping subjects have been monitored in the laboratory in a series of experiments in which nearly 1100 nights of sleep have been recorded. In most cases the acoustic stimulus has been the noise of a passing truck presented at selected sound levels and various times during the night. The level of sleep is monitored by means of electrical signals from the brain as measured by an electroencephalograph and recorded on magnetic tape.	E.A.G. Shaw Division of Physics Natl. Research Council of Canada Ottawa, ON K1A 0R6 Canada	(indefinite continuing in-house project)
Czechoslovakia	Research on Influence of Noise on Population Elaboration of a method directed to express the noise burden in various groups of population from different sources of noise. Study of influence of variable noise levels in domiciles on some indices of the health state and sleeping of children in dwellings	J. Havranek, M.D. Inst. of Hygiene & Epidemiology Prague, Czechoslovakia	To 1980
Federal Republic of Germany	Physiologic Investigations About Chronic Effects of Noise on Sleeping Subjects with Special Regards to Traffic Noise 1. Laboratory investigations about the effects of heavy traffic noise on sleep stage patterns, vegetative functions, mood and performance of younger subjects. 2. Development of a new system for electrophysiologic field studies in sleep research. 3. Field studies about chronic effects of traffic noise on sleep in human subjects.	Dr. W. Muller-Limmroth Institut fur Arbeitsphysiologie Technische Universitat Munchen Barbarastrasse 16 8000 Munchen 40, FRG	To December 1979

NOISE EFFECTS ON SLEEP

Country	Project Title and Brief Description	Investigator and Performing Organisation	Project Duration
Federal Republic of Germany	Experimental Investigations About the Effects of Traffic Noise on Sleep Stage Patterns of Elder Subjects 12 subjects slept in the laboratory for 12 consecutive nights (age: 60 - 69 years). During the 3rd night noise from a busy street crossing (Leq = 67 dB(A) measured near the sleeper's head) was continuously presented via loudspeakers. Intermittent noise (Leq = 54 dB(A)) was presented during 5 consecutive nights starting with night 6. Sleep stages were scored from standard EEG, ECG and EMG recordings once every 15 seconds in accordance with the manual edited by RECHTSCHAFFEN & KALES.	Dr. W. Muller-Limmroth Institue fur Arbeitsphysiologie Technische Universitat Munchen Barbarastrasse 16 8000 Munchen 40, FRG	Completed by December 1976
France	Noise Effects on Sleep Field study, simulated noise.	Centre de Psychologie Appliquee 30, rue du Mogador 75009 - Paris, France	1977
	Field Study of Long Term Effects of Road Traffic on Sleep Quality	Centre de Psychologie Appliquee 30, rue du Mogador 75009 - Paris, France	1977
	Effects of Diurnal Noise on Night Sleep	Univ. de Lyon, France	1977
	Psychophysiological Effects of Aircraft Noise on Sleep	IRT - ARPENT, France	1977
	Intrinsic Effect and Effect of Noise Interaction with Temperature	Commission d'Etude du Bruit Sante Publique 36, avenue Charles de Gaulle 92200 - Neuilly-sur-Seine, France	1977
	Vegetative Modifications on Sleep Induced by Noise During Sleep	Commission d'Etude du Bruit Sante Publique 36, avenue Charles de Gaulle 92200 - Neuilly-sur-Seine, France	1977
	Polling Methods on Sleep Disturbance by Noise from Transportation	IRT France	1977

NOISE EFFECTS ON SLEEP

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
France	EEG and Cardiovascular Responses to the Noise During Sleep The research will be performed in three consecutive phases. Phase 1: Magnitude of the responses to traffic noise with peak intensities of + 5 dB(A), + 10 dB(A), + 15 dB(A), + 20 dB(A), + 25 dB(A) and + 30 dB(A) above the background noise (32 dB(A)). 10 subjects: young adults Phase 2: Habituation of the cardiovascular responses during a 15 night exposure to traffic noises. 10 subjects: young adults Phase 3: Magnitude of the responses to traffic noise in a group of 6 children (age range: 6 to 10 years) and in a group of 6 old people (more than 60 years).	A. Muzet, M.D. Centre d'Etudes Bioclimatiques du C.N.R.S. 21, rue Becquerel 67087 Strasbourg Cedex France	July 1976 to December 1978
Israel	The Hospital as an Acoustical Problem Numerous researches have shown that the sensitivity of sick people against all kinds of sound events is remarkable increased and the threshold concerning sleep-disturbance and actuation of negative reaction about 10dB lower than for healthy persons. Furthermore, the so-called health-sleep, even during daytime, is of great importance for the recovery of the sick, according to the opinion of a great number of physicians. On the other hand, the level of all kinds of noises still has a growing tendency and building materials are becoming lighter and thinner, without losing their required mechanical strength. Today it will be difficult to find sufficiently silent districts for the increasing number of hospitals, which our modern society requires. The aim of this study is as follows: 1. To measure, record and evaluate the present noise situation in different types of existing hospitals in various districts in town. 2. To learn the standpoint of the professional	L.H. Schaudinischky U. Livni Dept. of Appl. Acoustics Dept. of Public Works of the Govt. of Israel	1974 to December 1977

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Israel (continued)	people including physicians, concerning the general noise situation. 3. To correlate the judgement according to different objective measurement results. 4. To propose planning principles for better acoustical conditions in hospitals even in noisy districts.		
Japan	The Psychophysiological Effect of Noise Upon Sleep In the present study, the influence of noise upon sleep was investigated psychophysiologically. The subjects were 3 males and a female adult (ages 22-26 years). For each subject, 2 - 4 all night sleeps were recorded by the use of the polygraph EEG(C$_4$), heart rate, respiration, vertical and horizontal eye movements, and forehead plethysmogram under the exposures of intermittent and aperiodic noise.	N. Nagamura, A. Yagi, Y. Kuchinomachi Industrial Products Research Inst. Agency of Industrial Science and Technology Ministry of International Trade and Industry Japan	
Sweden	The Effect of Noise Disturbances on Sleep Objective: The effects of noise disturbance on different phases of sleep will be investigated with the aid of an EEG, ECG, and other electrophysiological registrations. Progress Report: During the FY 74/75, investigations were conducted on the influence of noise on the exact time (moment) a person goes to sleep. Disturbance from constant traffic noise at 45 dB(A) as well as noise from the passing of a truck at 55 dB(A) maximum level will prolong this phase. Noise exposition in conjunction with constant traffic noise measured at 43 dB(A) meant a diminishing	R. Akselsson Dept. of Environmental Hygiene Univ. of Lund Lund, Sweden	1973 to 1977

NOISE EFFECTS ON SLEEP

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Sweden (continued)	of REM (rapid eye movement) which confirms what has been found by previous tests. All individuals involved in these measurements were 20 to 25 year old men. During the fall of 1975, various telemetric systems to transfer EEG, ECG and other physiological registrations were carefully tested.		
United Kingdom	Habituation to Auditory Stimuli in Sleep The object of the study was to determine whether it is possible in sleep to adapt to repetitive sounds of an intensity insufficient to waken the subject (70 dB, 1 kHz, 1 second tones). Measures used were components of orienting response: autonomic responses (galvanic skin response, heart rate) and transient arousal without waking (electroencephalographic responses). Each sleep stage was studied separately. Autonomic responses died out after some 20 to 50 presentations, with the exception of heart rate changes in rapid eye movement sleep, which were not reduced significantly in that time. Transient arousals habituated only when the intervals between stimuli were regular and short (less than 30 seconds); they were maintained if stimuli were at irregular intervals of the order of half a minute. A pilot study was conducted during 1967/68 and the results of this have been published.	R. Firth, G. Horn, G. Lanman, R. Neighbour Cambridge Univ. Dept. of Anatomy Cambridge CB1 1TT	Current in 1975 or 1976

COMMUNICATION INTERFERENCE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
France	Noise Effects on Speech	CALP (Federation of French speaking Acousticians)	1977
Sweden	Methods to Judge the Effect of Noise on the Ability to Comprehend Speech by People Who Are Handicapped as Far as Hearing is Concerned Objective: To measure the comprehension of speech by normal people as well as various groups of people who are handicapped as far as hearing goes in simulated traffic noise measuring 40 dBA, 55 dBA, and 70 dBA.	Gunnar Anianssen Dept. of Audiology Sahlgrens Hospital 413 45 Goteburg Gothenburg, Sweden	1976
	A Sociopsychological Study of the Communication Problems and Degree of Invalidity of Workers with Hearing Impairments	Gunnar Liden Goteborg Univ. Sahlgrens Hospital 413 45 Goteburg Gothenburg, Sweden	1976
United Kingdom	Application of the Articulation Index to the Acoustical Design of Landscaped Offices The aims of this study are: (a) to establish the suitability of the Articulation Index as an acoustic design criterion for landscaped offices; (b) to investigate the acoustical environment within a specific office, with particular attention being paid to the problems of privacy; (c) to form some conclusions as to the effectiveness of modern and classical theory in the prediction of the acoustical environment within landscaped offices.	D.J. Croome-Gale Loughborough Univ. of Technology Dept. of Civil Eng. Loughborough Leicestershire LE11 3TU England	Current in 1975 or 1976
	Measurements have been carried out in two landscaped offices so far. Some laboratory tests have also been carried out to assess typical voice speech spectrum levels.		Current in 1975 or 1976
	The Effects of Hearing Earmuffs in Noisy Conditions: Speech Intelligibility Present results have shown, in agreement with previously published work, that wearing earmuffs in the presence of noise has little effect on the ability of the normal listener to understand taped	H. McRobert, G. Llewelyn Salford Univ. Dept. of Electrical Eng. Salford M5 4WT England	

COMMUNICATION INTERFERENCE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom (continued)	speech. The investigation is ongoing to include individuals with varying degrees of hearing loss.		
	Traffic Noise and Schools Work is being undertaken to investigate the range of exposure to traffic noise of teaching spaces in schools and the sound insulation of typical facades. An attempt is being made to relate the characteristics of the intrusive noise to the teachers reaction as measured by a questionnaire. Specific effects such as interference with speech communication are also being investigated.	W.A. Utley Building Research Establishment Building Research Station Garston Watford WD2 7JR England	Current in 1975 or 1976
	Tractor Noise Interference with the Perception of External Noises Investigations have been made of the interference of both noisy and quieted tractor cabs and of hearing defenders with the ability of the driver to hear either warning cries or external noises from, for example, machinery. These studies have been made both for persons with normal hearing and for those with some deficiencies.	J.D.C. Talamo Natl. Inst. of Agricultural Eng. Ergonomics Dept. Wrest Park Silsoe Bedford MK45 4HS England	Current in 1975 or 1976
	Effects of Noise on Aircrew The effects of noise on aircrew are being studied with reference to the efficiency of communications in the air, and to the possible hazard to hearing due to repeated exposure to noise, speech and other signals. The acoustic conditions at the ear are being measured in flight in fixed winged aircraft, and in helicopters. Work is also proceeding to improve the noise attenuating properties of aircrew helmets. Methods of measurement of the attenuation in use, and in development and production control are being developed. Work has recently commenced on the effects of simultaneous noise and whole body vibration on task performance and fatigue.	Miss K. Haslen, G. Road, & S. Moore Royal Aircraft Establishment Flight Systems Dept. Farnborough Hampshire GU14 6TD England	Current in 1975 or 1976

COMMUNITY OR COLLECTIVE RESPONSE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Australia	Assessment of Community Response to Road Traffic Noise 24 hour measurement of noise levels at 19 sites along roadways with traffic volumes ranging from 4,000 to 57,000 veh/day. Approximately 1000 respondents living along the above study roadways were interviewed to ascertain the effects of noise on them, and their annoyance with noise. Correlation of noise levels with community.	Al Brown Univ. of Queensland St. Lucia Brisbane, Queensland Australia 4067	July 1975 to June 1976
	Community Reaction to Noise The aim of the project is to conduct field studies to determine community reaction to noise and levels at which significant objections can be expected (e.g., percentage of people, by socio-economic groupings, rating noise environment as acceptable).	C.H. Coneybeare A.C. Potter New South Wales Dept. of Roads 300 309 Castlereach St. Sydney, New South Wales, Australia 2000	July 1975 to June 1976
Austria	Noise Load on Streets; Efficiency and Cost of Noise Abatement Measures A small part of the investigation is a questionnaire on subjective response of people to road traffic noise and their subjective feeling on the possibilities of control measures (screens and similar) and their subjective feeling on the value of noise control measures. The results should i.a. give basic data for cost-benefit calculations.	Dr. Judith Lang Versuchsanstalt fur Warme und Schalltechnik am Technologischen Gewerbemuseum, A-1090 Wien Wahringerstrasse 59 Austria	1977
Belgium	Measurement of the Noise Around Small Airports and Inquiry About the Annoyance A study will be made of the noise level in the neighborhood of four small airports. An inquiry will be made about the annoyance. The validity of two different noise exposure formulae, one based on the maximum level, the other on the equivalent level will be checked.	Dr. H. Myncke Dr. A. Copa Laboratorium Voor Akoestiek En Warmtegeleiding Celestijnenlaan, 200 D 3030 Heverlee, Belgium	January to December 1977

COMMUNITY OR COLLECTIVE RESPONSE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Canada	Rationale for Motor Vehicle Exterior Noise Standards Measurements of ambient noise levels in communities of differing socio-economic status and subjected to differing levels of road traffic noise and being correlated with the results of a social survey of the communities. The survey instrument is designed principally to measure annoyance but includes other factors such as noise-related symptomatology. The results will serve to indicate the extent to which the results of more extensive studies conducted in other countries, particularly the United States, can be generalized to the Canadian situation.	Dr. J. S. Bradley R. A. Jonah Sound and Vibration Laboratory The Univ. of Western Ontario London, Ontario N6A 5B9 Canada	June 1975 to May 1977
Czechoslavakia	Research on Influence of Noise on Population Elaboration of a method directed to express the noise burden in various groups of population from different sources of noise. Study of influence of variable noise levels in domiciles on some indices of the health state and sleeping of children in dwellings.	Dr. J. Havranak Institute of Hygiene and Epidemiology Prague, Czechoslavakia	Estimated completion 1980
Federal Republic of Germany	Urban Noise Study Study on the effects of urban noise exposure (mainly road traffic noise) on human behaviour and social/psychic/somatic wellbeing. Methods: Accoustical measurements and psychological/sociological interviews (19 areas, 642 respondents).	H.O. Finke, Dr. R. Guski, Dr. B. Rohrmann Physikalisch-Technische Bundesanstalt D-3300 Braunschweig FRG	1975 to 1978
	Content Analysis of Noise Complaints This project is part of a greater research project, in which mainly psychological effects of different sources of sound are investigated in a large city of Germany. The content analysis of 1.4000 noise complaints was done as a means to registrate the most annoying sources of sound, their different effects in the perception of complaints and their cognitive evaluation. This led to the formulation of hypotheses	Dr. Rainer Guski Physikalisch-Technische Bundesanstalt Braunschweig/ Berlin FRG	Completed in June 1976

COMMUNITY OR COLLECTIVE RESPONSE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Federal Republic of Germany (continued)	and questionnaire-items for the larger research project. A report of this project is accepted for publication in "Environmental Research".		
	Contribution to the Determination of the Irritation Level Caused by Traffic Noise as a Function of Traffic Patterns and Traffic Density in Areas of Population Concentration The aim of this study is the comparison of objective noise measurements with subjective feelings of the affected population. The differential irritation caused by various means of transportation is to be studied, starting with street traffic and rail traffic (dB). The study is based on noise measurements at selected sites and on polling results at the same sites regarding environmental protection and quality of living conditions.	Ekkehard Holzmann Institute for Railroad & Highway Construction Stuttgart FRG	1976 to 1977
	Disruptive Effect of "Autobahn" Noise on Those Living along its Right-of-Way The disruptive effect of the autobahn is to be documented with accoustical measurements and sociological polling methods	Dr. Ing. Edmund Bucht Inst. for Hygiene & Occupational Medicine Duesseldorf, Gurlittstr 53 FRG	
France	Aircraft Noise Effect on Equilibrium of the Airport Neighborn	Institut Francais d'Opinion Publique 20, rue d'Aumale 75009 - Paris, France	1977
	Acoustic Insulation of Dwellings in Relation to Dwellers Satisfaction	CSIB France	1977

COMMUNITY OR COLLECTIVE RESPONSE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
France	Evaluation of Inconvenience due to Noise Summary: This research request pursues the following partial objectives: • evaluation of sleep disturbance by airplane noise • elaboration of noise inconvenience index common to automobile and aircraft traffic. Elaboration of Noise Inconvenience Index Common to Automobile and Aircraft Traffic The acoustic index allowing for appreciation of noise inconvenience to neighborhood residents depends on transportation means considered. But in many areas, the residents are exposed to noises originating from different sources. A common index was never tested. A poll of 700 people was prepared in 1976 and exhaustive acoustic measurements were made. The polling took place at the end of 1976. Total acoustic and psychological data are to be processed and the final report is to be written in 1977.	Michel Vallet & Marie-Anne Page Institut de Recherche de Transport France	1976 to 1977
Hungary	Study of Annoyance due to Traffic Noise Social survey on annoyance of road traffic noise and associated noise measurements will be carried out in Budapest and two another towns. Various parameters of road traffic noise will be correlated to annoyance reactions. Similar study is planned for aircraft noise in the vicinity of Budapest Airport. Publications: Csabalay, L., Hirka, F., Sarvari, L., Kiripolszki, I. Untersuchung des Strassenverkehrslarms in Wohngebieten/Investigation of road traffic noise in dwelling areas/ The 9th International AICB Congress, Budapest, 27-30.9.1976	Laszlo Csabalay Natl. Inst. of Hygiene Gyali ut 2-6 H-1966 Budapest, Hungary	1975 to 1980

COMMUNITY OR COLLECTIVE RESPONSE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Japan	Field Survey on the Health Effects of Exhaust and Noise from Free-way Traffic Differences in noise distribution in the vicinity of roads due to character and volume of traffic on the roads was investigated. The awareness of the road inhabitants in the vicinity was surveyed in order to analyse the effect of the physical noise level on mental disturbance. According to the results of the study, the degree of disturbance induced by noise is most influenced by the noise level, next by the occupation of the head of the household, how often a person uses an automobile and by the age of persons. Another factor which greatly affects the level of "disturbance" is the characteristic of the local community, which is highly correlated to the noise level. For analysis, a few different kinds of methods were used, i.e., analysis by quantification and a multivariate analysis.	Dr. T. Suzuki Research Inst. for Social Survey 11-14-2 Yato-Machi Tanu-aki, Tokyo Japan	1976 to 1977
	Health and Social Effects of Aircraft Noise in the Vicinity of the Osaka International Airport a) Effects on behavior and body weight of new-borne babies and infants b) Community reaction to the noise using questionnaire c) Social effect and cost of the airport	Drs. J. Maekawa, Y. Ando, H. Hattori, S. Komori Itami City Osaka Prefecture, Japan	1972-
Netherlands	Study of the Dose-Effect Relationship for Rail Traffic Noise The study is divided into three phases: A. Preliminary study. An inventory is taken of the dimensions used aboard and for other noise sources. A plan will be devised for the dose-effect study. B. Dose-effect study. The literature containg little information on the effect of rail traffic on man. By means of questionnaires, the necessary data will be collected. The study is directed primarily at man in his residential environment. Other areas	Volksgezondheid en Milieuhygiene (sponsoring organization)	

COMMUNITY OR COLLECTIVE RESPONSE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Netherlands (continued)	can be included in a follow-up study. This study can include the abatement arising as a result of shunting activities or side railing of rail vehicles (train-forming tracks, car barns). C. Setting standards. Following the data obtained in the previous phases, a comparison will be made between the laws and guidelines existing abroad and the results of this study.		
	Dose-Effect Relation Study for Aircraft Noise Recent studies of an epidemiological nature around Schiphol have emphasized that significant deviations in the state of health can occur in the near vicinity of airports. The present study has the purpose of making the results of such studies available for civilian adaptation and also to offer the possibility of setting up a supplementary study for the purpose of setting standards. In the study, wide consideration is given to foreign studies.	Public Health and Environmental Hygiene Dept. Dokter Reijerstraat No. 12 Leidschendam The Netherlands	
	Experience with Noise Resisting Equipment in Living Situations The application of noise-resisting equipment on houses to limit the noise from aircraft can result in unfavorable secondary effects, due to which the situation is not experienced as better by the dweller. Especially in the case of aircraft noise, thought is given to "bunker effects" and maintenance problems. The appreciation of the owner is important for the decision concerning the nature and the carrying out of the measures in other situations in the framework of the program within the noise zone. By means of enquiry, the study results can be used for improving the insight into the relationships between noise pollution due to aircraft and the scope of obstacles.	Public Health & Environmental Hygiene Dept. Dokter Reijerstraat No. 12 Leidschendam The Netherlands	1976 estimated completion

COMMUNITY OR COLLECTIVE RESPONSE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Netherlands	Study for Establishing Airport Noise Zoning Criteria For setting up noise zones around airport terrain, it is necessary to dispose over elementary planning preliminary values, where determinations made within the zone must suffice. The study examines the noise sensitivity of men in different situations and expresses this in the form of the noise level permissible for the area.	Public Health & Environmental Hygiene Dept. Dokter Reijersstraat No. 12 Leidschendem The Netherlands	
Norway	Road Traffic Noise in Urban Areas Approach: Social surveys (500 respondents) and long-time measurement in areas with different time-distributions of road traffic: (I) steady traffic all week (II) steady traffic during daytime-period on workdays (III) predominantly rush-time traffic on work-days.	K. Gjestvenes, S. Solberg, E. Arntzen Oslo City Health Dept. St. Olavs plass 5 Oslo 1, Norway	January 1976 to July 1979
Poland	The Effect of Airplane Noise on the Inhabitants of Areas Near the Okecie Airport in Warsaw The psychological and physiological effects of aircraft noise were studied in residents of two areas near a large airport in Poland. A health questionnaire and a noise disturbance scale were used to survey 256 residents in area A (noise levels exceeding 100 dBA) and 255 residents in area B (noise levels of 80-90 dBA). The people surveyed were grouped according to sex, age, living conditions, education and socioeconomic level. The relative annoyance level for area A was 82% and for area B, 54%. The survey population had a normal distribution of psychological problems. The health questionnaires documented the frequency of complaints of various ailments. No statistically significant differences in complaints were found in groups of men living in the two areas. Significantly greater numbers of complaints related to the cardiovascular system, the digestive system, frequency of taking medication for heart problems or	Z. Kossarny, B. Maziarka, H. Szata State Hygienic Inst. of Warsaw Warsaw, Poland	Completed by 1976

COMMUNITY OR COLLECTIVE RESPONSE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Poland (continued)	headaches, and nervousness were found in women living in the noisier area (A) than in women who lived in the lower noise level area (B). The results indicate that aircraft noise can have an effect on the general state of health. The authors note that many other stressful and adverse conditions besides noise may affect state of health, such as the work environments of the people studied.		
Sweden	Annoyance Reactions to Traffic Noise Exposure Objective: To study the relationship between exposure to different levels of traffic noise and the distribution of annoyance reactions in the exposed population. The areas of investigation were chosen in order to elucidate conditions in areas exposed to 70-90 dB(A) - the critical range of exposure from the hygienic point of view. R. Rylander, S. Sorensen & A. Kajland: Traffic Noise Exposure & Annoyance Reactions--J. Sound Vibr. 47 (1976)	Ragnar Rylander Dept. of Environmental Hygiene Univ. of Gothenburg Fack S-400 Gothenburg, Sweden	1973 to 1977
	The Disturbing Effects of Train Noise on Exposed Population Groups Objective: To study the distribution of disturbance reactions from the exposure of noise from trains.	Stefan Sorensen Dept. of Environmental Hygiene Natl. Swedish Environmental Protection Board Snidaregen 5 17120 Solna, Sweden	1975 to 1977
Switzerland	Social Survey on Modern Flats In the frame of this survey, traffic noise was measured and an investigation on the frequency and the degree of annoyance on 800 subjects was made. ("Wohnen im Neubau", by B. Wehrli, S. Huser, H. Egli, P. Bakke & E. Grandjean, Paul Haupt Verlag Bern, 1976).	E. Grandjean Dept. of Hygiene & Ergonomics Swiss Federal Inst. of Technology Zurich, Switzerland	

COMMUNITY OR COLLECTIVE RESPONSE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Environmental Factors in Relation to Traffic, in Relation to Residential Areas A sociological survey of a selected sample of residential developments and measurements of noise, fumes and traffic characteristics in relation to the developments. A further survey has been undertaken of residents who have moved from one area to another and comparisons of attitudes to their different environmental experiences have been compared. Both direct interviews and questionnaires were used. Comparisons of accessibility and mobility have been made for householders in a small sample of English and Indian respondents.	P.D. Hobbs Birmingham University Birmingham..B15 2TT England	April 1976
	Community Reaction to Road Traffic Noise An investigation of dissatisfaction caused by traffic noise aroung Manchester is in progress. 27 sites have been selected to provide a range of exposures to traffic noise from freely flowing urban roads, congested urban roads or motorways. A social survey involving about 1800 households has been completed and 24 hour noise measurements at every site are now being collected. One of the many aims of this project is to determine if an existing noise index like L10 (18 hour) or Leq can adequately reflect community reaction to noise from a wide range of traffic flow conditions.	N.J. Yeowart, A.W. Rossall, D. Wilcox Salford Univ. Dept. of Electrical Eng. Salford M5 4WT England	Current in 1975 or 1976
	Environmental Impact of Road Improvement Schemes in Rural Areas The objectives are to study the factors that affect the public's perception of the environmental damage resulting from road improvement schemes and to relate the implied value to the type of landscape, the measures adopted for siting and landscaping the road, the scale of the road and traffic. The environmental changes considered will include change in noise	D. Fiddes, L.H. Watkins Transport & Road Research Laboratory Environmental Div. Crowthorne Berkshire RG11 6AU England	Current in 1975 or 1976

COMMUNITY OR COLLECTIVE RESPONSE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom (continued)	levels related to the levels acceptable to people wishing to use areas adjacent to the road. The programme will assist in the establishment of suitable design standards for roads in rural areas. To date a survey of public attitudes in the Lake District has been made and further surveys are planned.		
	Urban Environment Simulation The objective is to discover the values that people place on variations in their home environment that result from road and traffic changes. The method involves tests of peoples response to a simulated lounge and variable external environment. A progress report describing the pilot studies has been published.	R.F.P. Dawson Transport & Road Research Laboratory Environmental Div. Crowthorne Berkshire RG11 6AU England	1970-
	Environmental Surveys The objective is the assessment of the environmental effects of new roads, of changes in existing roads and of traffic management schemes and of the relative values that are placed on different effects. To investigate the possibility of obtaining monetary values to place on such changes.	(same as above)	Current in 1975 or 1976
	Evaluation of Environment This is aimed at evaluating in monetary terms the so-called "intangibles" in cost-benefit analysis relating to environment. A method has been devised for collating "market" decisions relating to various aspects of the environment in a given context. An estimate of the value lost due to the presence of noise around the home has been obtained and the value of historic buildings, the countryside, recreational facilities, etc. are being studied. These data have been used in the cost-benefit analysis of noise reduction and transportation projects.	R.A. Waller et al Atkins Research & Development Woodcote Grove Ashley Rd. Epsom Surrey KT18 5BW England	Current in 1975 or 1976

COMMUNITY OR COLLECTIVE RESPONSE

Country	Project Title and Brief Description	Investigator and Performing Organisation	Project Duration
United Kingdom	External Noise Carry out studies of subjective reactions of people in dwellings and the effects upon sleep of mixed noise exposures arising from road traffic and relate these to noise exposures. Examine the range of sound insulation values provided by facades of school buildings. Give guidance on the setting up of Noise Abatement Zones and develop further guidance on the prediction and control of noise from industrial premises. Study noise emission from construction sites to determine better prediction methods. Set up new test facility to compare alternative methods for measuring noise output of construction plant for inclusion in EEC Directives. Investigate various methods of measuring Leq. Investigate methods of measuring and predicting noise from railways.	Drs. F.J. Langdon, W.A. Utley, Mr. D.E. Sexton Building Research Establishment Garston, Watford WD2 7JR Hertfordshire, England	1976 to 1977
	Four studies in preparation: - The place of noise in environmental evaluation - Monetary evaluation of noise - The reliability of social surveys (a test-retest study) - Effect of noise from neighbors in relation to party wall insulation standards.	John Langdon (address same as above)	

DOMESTIC ANIMALS AND WILDLIFE

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Japan	**Effects of a Buzzer Treatment on Egg Laying Performances of Japanese Quail (Coturnix Coturnix Japonica).** Four strains of Japanese quails were raised under a buzzer treatment of 85 phon every other hour. A little detrimental effect of the noise was observed on the egg production rate during the early period of treatment. On the other hand, shell-less egg incidence of birds subjected to the noise was increased slightly as compared the same character of birds raised under noiseless environment.	Chozo Oshima, Lee Won Ho Takatada Kawahara and Toru Fujishima National Institute of Genetics, Mishima, Japan	1974 to 1978

NOISE ENVIRONMENT DETERMINATION

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Denmark	Do We Measure Damaging Noise Correctly? For steady industrial noise without excessive impulses, the risk for hearing loss is reasonably well related to the total noise dose criterion. However, the inadequacy of the criterion's assessment of the hearing loss risk for fluctuating industrial noise with relatively high peak values has led to the investigation of impulses encountered in industrial environments. The majority of industrial noise has a higher intensity in the 250 Hz to 500 Hz frequency range than at 6 kHz, while the short duration peaks contain a significant amount of energy in the 4 kHz to 6 kHz frequency region. Because the frequencies in the 4 kHz to 6 kHz range are also amplified in the outer and middle ear, the short duration peaks seem to play a dominant role in contributing preferential damage in this range. A simple method for setting limits for hearing loss risk has been proposed, considering the crest factor of noise when weighting the noise dose criteria. Date of publication: Noise Control Engineering, Mar./Apr. 1977	P. V. Brueel Brueel & Kjaer 23 Linde Alle DK-2850 Naerum, Denmark	
Federal Republic of Germany	Methods of Sound Measurement at Working Places - comparison between different methods of sound measurement - relation to audiograms	Dr. A. von Luekpe Suddeutsche Eisen - und Stahl -Berufsgenossenschaften Institut fuer Larmbekampfung Hindenburgstr. 8 D-6500 Mainz 1, FRG	1976 (planned)
	A Contribution to the Dosimetry of Work Noise with due Regard for Long Term Fluctuations in Level Various possibilities are presented for achieving a more adequate evaluation of long-term-fluctuating work noises than is possible under DIN 45641: (1) Determination of a physiologically equivalent (to the ear) continuous noise level "Leq" from the period of one sound (2) Hearing threshold dosimetry (3) Measurement of one risk-proportional noise dose (rid). For each of the listed methods, a measurement technique is developed and tested.	Heinrich Eder Inst. for Machine Tools and Management Technology Muenchen 2, Arcisstr 21 FRG	

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Finland	Paper Machine Noise The aim of the study is to determine the noise level in paper machine halls and the characteristics of paper machines and machine halls affecting the noise level.	P.U. Lehtinen, et al TYOTERVEYSLAITOS Inst. of Occupational Health Haartmanink. 1, SF-00290 Helsinki 29 Finland	Estimated completion 1977
	Study of the Work Environment of the Engine Crews Employed by the Finnish State Railways A study concerning the working conditions in the engines and the engine houses and their effects on the health of engine crews (engineers, assistants, apprentices) employed by the Finnish State Railways was started at the end of 1974. This study will be carried out in collaboration with the Board of Administration of the Finnish State Railways and the Union of Railway Engineers. The study consists of four subprojects, one of which is a survey of working conditions in the engines. It includes measurements of noise, vibration, and temperature in various engine models.	T. Partanen, et al (same address as above)	1974-
	Development of Methods for Measuring Adverse Effects of Noise	(same address as above)	planned
France	Attack on Noise and Vibration The problem of the struggle against noise and vibration takes on a growing importance in modern life and it is my duty to have recently undertaken diverse research with the goal of facilitating and improving the measurement methods. The long term goal of this research will be principally to test and to state precisely a method permitting the objective evaluation of the inconvenience and nuisance of noise whatever be its origin, duration, and spectral composition.	Rene Lehmann Dept. de Physique de la Faculte des Sciences Univ. du Maine Route de Laval B.P. 535 72017 Le Mans, Cedex France	

NOISE ENVIRONMENT DETERMINATION

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Japan	Survey and Evaluation of Environmental Noise Through the Total Amount of Noise Emission and Personal Noise Exposures Comprehensive survey is being made for grasping the emitted power of noise from various sources such as industrial plants, transportation system, etc., and personal noise exposures in classified residing areas and occupations. For noise exposure survey, two kinds of equivalent sound level meters were developed. One of them indicates 24 hour noise exposure index, and the other can store Leq in every 10 minutes over 24 hours. Aiming at the unification of the noise rating units reappraisal and laboratory experiments are also being carried as a part of the integrated study. The goal of this project is to obtain the relationship between the total amount of emmitted noise power and the population exposed to every level of noise, and to prepare the integrated data for noise regulation and control in the country. The project will finish by the end of March, 1979, and the integrated report will be published after that date.	T. Nimura, T. Sone, S. Kono, M. Ebata, M. Kumagai et al Faculty of Engineering Tohoku Univ. Sendai, Japan	April 1976 to March 1979
Sweden	Comparison of Noise Dose Meters Six personal noise dose meters compared with respect to their response to impulsive noise. Published as message No. 5 1977 from Arbetsmiljöinstitutet Verkstadsindustrin.	J. Svensson Ingemansson Acoustics Box 53037 S-400 16 Gothenburg Sweden	February to March 1977

NOISE ENVIRONMENT DETERMINATION

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Noise Levels in Industry Hazardous to Hearing; Impulse Noise An analysis is being made of weighting and octave band measurements from many different methods of predicting hazardous conditions are being compared. Various methods of measuring impulse noise are being investigated and compared. These include the use of impulse and other sound level meters, the level recorder, the pocket dose meter, and the cathode-ray oscillograph. Special application of impulse noise such as correlation analysis and the determination of transfer functions are also being studied. All work involves extensive use of computer programs.	Hull College of Technology Dept. of Mathematics and Physics England	1968-

NOISE CONCOMITANT WITH VIBRATION

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Federal Republic of Germany	NITTS and Peripheral Blood Flow Under Simultaneous Influence of Noise and Hand-Arm Vibration - combined factors noise and vibration - NITTS, skin temperature, fluvographic, finger-pulse amplitude	Dr. H. Dupuis Arbeitsgruppe Anthropotechnik des Max-Planck-Institues fur Landarbeit und Landtechnik Am Knuzenberg, FRG D-6550 Bad Kreuznach and A. Weichenrieder	Current in 1976
Poland	Investigations into the Noise Effects in Miners and Steel Workers Special attention given to the influence of noise and vibrations on sight, hearing and touch senses.	J. Grzesik Inst. of Professional Medicine Nieruta 20 41-200 Sosnowiec Poland	1977
	An Acoustic Evaluation of Automotive Vehicles from the Point of View of the Noise and Vibrations Influence on Driver's Work This study investigates the acoustic conditions inside trucks and buses operated at National Motor Transport Enterprise, and the effects of noise and vibration on the drivers performance. Road tests, and simulated laboratory studies are being done. The acoustic climate will be determined, and methods for abating noise, will be explored. Results will help to set standards. Safe and practical inspection techniques will be developed.	Dr. Jerzy Miazga Instytut Transportu Samochodowego 40 Stalingradska St. 03-301 Warsaw, Poland	1976 to 1978

NOISE CONCOMITANT WITH VIBRATION

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Effects of Noise and Vibration on Man Work investigating the interaction of the effects of noise and vibration on man.	W.F. Floyd, J. Sandover Loughborough Univ. of Technology Dept. of Human Sciences Loughborough Leicestershire LE11 3TU England	Current in 1975 or 1976
	Low Frequency Noise and Vibration Effects in Transportation A series of measurements in passenger and commercial vehicles is now in progress and has already shown high levels (up to 120 dB) of infrasound at motorway speeds. Investigation in vehicles is continuing together with work on a laboratory system to simulate the complete sonic and infrasonic noise spectrum from 1 to 20,000 Hz. This work aims to assess the significance of infrasound in transportation in relation to comfort and safety, and to examine the effects of noise and vibration on the health and well-being of drivers.	M. Tempest, P. Lord Salford Univ. Dept. of Electrical Eng. Salford M5 4WT England	Current in 1975 or 1976
	Effects of Noise on Aircrew The effects of noise on aircrew are being studied with reference to the efficiency of communications in the air, and to the possible hazard to hearing due to repeated exposure to noise, speech and other signals. The acoustic conditions at the ear are being measured in flight in fixed wing aircraft, and in helicopters. Work is also proceeding to improve the noise attenuating properties of aircrew helmets. Methods of measurement of the attenuation in use, and in development and production control, are being developed. Work has recently commenced on the effects of simultaneous noise and whole body vibration on task performance and fatigue.	K. Haslen, G. Rood, S. Moores Royal Aircraft Establishment Flight Systems Dept. Farnborough Hampshire GU14 6TD England	Current in 1975 or 1976

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom	Construction Noise This is part of the DOE research programme undertaken jointly with BRE. The objectives are to define the procedures necessary to assess, measure and predict the impact of noise and vibration arising during the construction or maintenance of works ancillary to transport systems. This study will include research on the subjective effects of construction site noise.	Transport & Road Research Laboratory Environmental Div. Crowthorne Berkshire RG11 6AU England	Current in 1975 or 1976
	Whole-Body Vibration and Aircrew Performance Determine effects of vibration level, frequency and on performance of manual control tasks and visual tasks. Research conducted in the laboratory with simulated aircraft (helicopter) configuration and tasks. Griffin, M.J. (1976) Human Factors 18 (6) 601-606 " " " & Lewis, C.H. (1977) Sound Vibration (awaiting publication) Lewis, C.H. & Griffin, M.J. (1977a) Sound Vibration (awaiting publication) Lewis, C.H. & Griffin, M.J. (1977b) Sound Vibration (awaiting publication)	Dr. M.J. Griffin, Dr. C.H. Lewis Human Factors Research Unit Inst. of Sound & Vibration Research Univ. of Southampton Southampton SO95NH England	Current in 1975 or 1976
	A Procedure for Evaluating Human Response to Vibration To derive a general procedure for predicting the subjective response to complex whole-body vibration in and around transport systems. Research entails a series of laboratory experiments and associated field experiments. Data is being used to amend existing vibration standards. Griffin, M.J. & Whitham, EM (1976) J. Sound Vibration 48 (3) 333-339 Griffin, M.J. (1976) J Acoust. Soc. Amer. 60 (5) 1140-1145 Griffin, M.J. & Whitham (1977) J. Sound Vib. 54 (1)	Dr. M.J. Griffin, E.M. Whitham, K.C. Parsons Human Factors Research Unit Inst. of Sound & Vibration Research Univ. of Southampton Southampton SO95NH England	Current in 1975 or 1976

NOISE CONCOMITANT WITH VIBRATION

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
United Kingdom (continued)	Whitham, E.M. & Griffin, M.J. (1977) SAE Paper 770254 Parsons, K.C. & Griffin, M.J. (1977) Ergonomics (awaiting publication)		

OTHER
(INCLUDES NOISE EFFECTS LITERATURE & WORKSHOPS)

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Canada	Thiessen, G. Effects of Noise on Man, National Research of Council Associate Committee on Scientific Criteria for Environmental Quality, 1977.	National Research Council Div. of Physics Ottawa, Canada K1A 0R6	
France	Study of Infra and Ultra Sounds (Bibliographic Study)	Institut National de Recherche sur la Securite Route de Neufchateau 54500 - Vandoeuvre France	
	Effects of Intermittent and Impulsive Noise (Bibliographic Study)	Institut National de Recherche sur la Securite Route de Neufchateau 54500 - Vandoeuvre France	
Federal Republic of Germany	Noise Protection Principles: Elucidation of Terminology on Noise Effects 1. Coordination of the implementation of the program on "Noise Protection Principles". 2. Implementation of a research project entitled "Elucidation of Terminology on Noise Effects". 3. Establishment of a comprehensive bibliography of national and international literature dealing with noise and sleep, with critical evaluations.	Dr. Werner Klosterkoetter Inst. for Hygiene and Labor Medicine of the Univ. of Essen Hufelandstrasse 55 Essen, FRG	9/8/73 to 11/1/76
Sweden	International Workshop on Health Effects of Environmental Noise	Dr. Ragnar Rylander Dept. of Environmental Hygiene Univ. of Gothenburg Fack S-400 33 Gothenburg 33 Sweden	3/1977

OTHER

Country	Project Title and Brief Description	Investigator and Performing Organization	Project Duration
Switzerland	Environmental Health Criteria for Noise The purpose of this document is to present a condensed but critical review of noise criteria. The reviews are based on published scientific papers and reports and on information obtained from recognised scientific groups and research institutes. Other objectives are to identify gaps in knowledge on health effects of noise and to promote the harmonisation of measurement and assessment methods so as to obtain internationally comparable results. The Environmental Health Criteria for Noise include chapters on characteristics and measurement of noise, effects of noise, evaluation of health risks to man from exposure to noise and recommendations for further research.	Dr. V.B. Vouk & Dr. H.W. de Koning World Health Organ. Div. of Environmental Health 1211 Geneva, Switzerland	1974 to 1977

INDEX OF PROJECTS BY COUNTRY

* Project listed in two categories.

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15. SUPPLEMENTARY NOTES

16. ABSTRACT

This volume has been compiled from the results of a survey on foreign noise effects research from 1975-77. The survey was conducted for the second interagency noise effects research panel. Included in the volume are 211 project descriptions, from twenty-two countries. Projects are reported under the following subject areas: noise-induced hearing loss, non-auditory health effects, psychological and performance effects, noise effects on sleep, communication interference, community or collective response, effects of noise on domestic animals and wildlife, noise environment determination, and noise concomitant with vibration.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Noise, hearing loss, non-auditory physiological and psychological effects, performance effects, communication interference, sleep disturbance, annoyance		

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